DRAGON USER

International edition

The independent Dragon magazine

75p US$3.25 December 1984

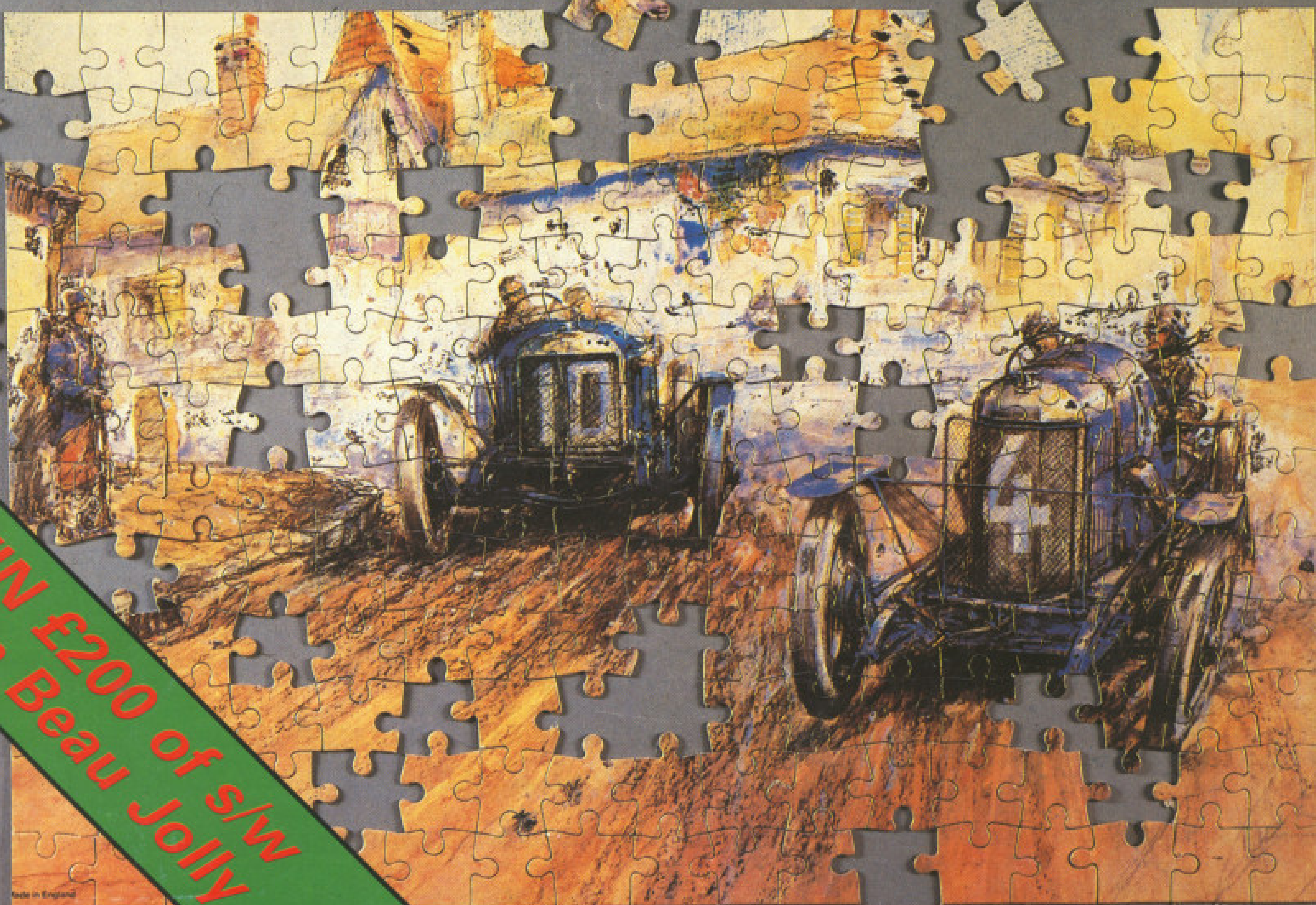
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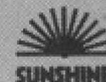
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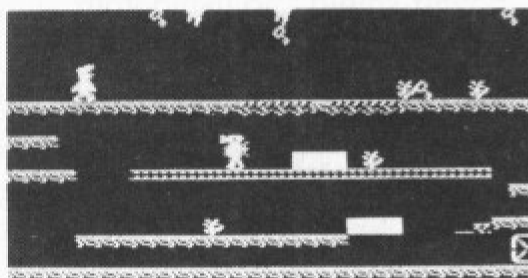
The quality of the material we can publish in *Dragon User* each month will, to a very great extent depend on the quality of the discoveries that you can make with your Dragon. The Dragon computer was launched on to the market with a powerful version of Basic, but with very poor documentation.

Articles which are submitted to *Dragon User* for publication should not be more than 3000 words long. All submissions should be typed. Please leave wide margins and a double space between each line. Programs should, whenever possible, be computer printed on plain white paper and be accompanied by a tape of the program.

We cannot guarantee to return every submitted article or program, so please keep a copy. If you want to have your program returned you must include a stamped, addressed envelope.

Contents





Editorial

NINETEEN EIGHTY FOUR is a date that has been associated with catastrophe and terror ever since George Orwell wrote his chilling vision of the future in 1948. In the event, of course, 1984 turned out to be something of an anticlimax. No Big Brother, no Airstrip One.

For the computer industry, however, 1984 still has a certain significance. The pundits who had been predicting a massive shake-out in the market drew some satisfaction from the disappearance of Tycom and Camputers, though this was balanced to some extent by the emergence of Amstrad.

The Japanese also made their long-awaited entrance into home computers with the much-hyped MSX. But, despite the Japanese domination of the hi-fi and electronics markets, there are some doubts as to whether they will similarly take over the micro market. The Z80, eight bit, standard around which MSX is based may be too old-fashioned when compared with the newer 16-bit offerings from Sinclair et al.

Dragon, despite hefty cash injections, failed to overcome its cashflow and overstocking problems, with the result that it was sold to Spanish company Eurohard. Dragon software houses immediately started to convert their programs to other machines, if they had not done so already.

Jack Tramiel, the man who founded Commodore and built it up into a multi-million pound company, resigned in a boardroom dispute. But, he bounced back within months to buy troubled Atari from Warners. So, 1984 has been a year of considerable change for the computer industry, if not quite the watershed envisaged by Orwell. What 1985 holds in store is difficult to predict, other than that the market will become yet more competitive. To misquote an ancient Chinese proverb: "We live in interesting times."

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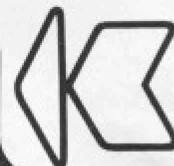


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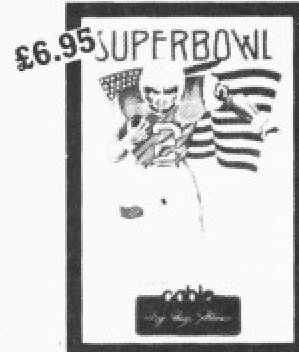
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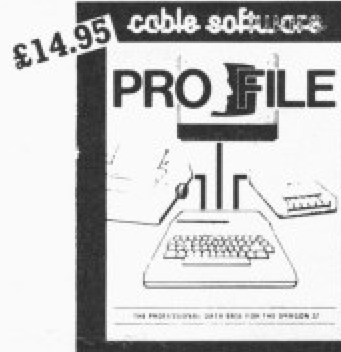
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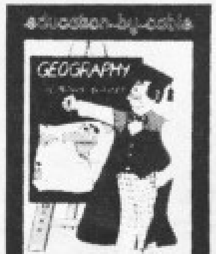


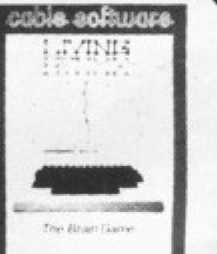












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Letters

This is the chance to air your views — send your tips, compliments and complaints to Letters Page, *Dragon User*, 12-13 Little Newport Street, London WC2R 3LD.

Sing Dragon . . .

IT MAY interest some readers who wish to use their Dragon to control a musical keyboard that they can in fact do so with the recently released Casio MT 2000. This is one of a selection of mini-keyboards from Casio, it costs £130, and to link it up to the Dragon 32 the keyboard has an accessory interface — the PA 1. This costs £30, and plugs into the Centronics socket via a printer cable.

Using this system, the computer can be used to select one of the eight preset voices, start or stop one of the six preset rhythms, and can play up to eight notes — so the computer could be used as a sort of "sequencer" to build up a melody, or chord accompaniment, which can be played whilst you pick out a tune.

Obviously, it does not have the facilities of the MIDI system, or of a synthesiser. However, it does provide the Dragon with an excellent sound system at a reasonable price. The software must (at present) be home grown, but there is not too much heavy programming effort involved. I have this system myself and am basing a project for college on it.

Which brings me on to ask if anyone could tell me the function of each pin in the Centronics socket (Busy, Strobe and so on). This will form a major part of my project and I would be very grateful for any help received.

Raymond McKean
4 Mirfield Avenue
Higher Blackley
Manchester M9 2WN

. . . sing

IN ANSWER to the simultaneous pleas from M Webb and J A Gill in October's Letters Page for A to D converters, I would like to point out that Electroanalytical Technology has been marketing a general purpose "control interface" for some months now.

The board, which plugs into the cartridge port, has both analogue (A to D and D to A converters) and digital input/output facilities (TTL, input interrupts and relay options). For the purpose of controlling voltage-controlled oscillators, the D to A converter has an 18V output voltage swing which should easily control a musical synthesiser. Software is not so much of a problem as the manual carefully explains the individual functions of components used in the interface and gives Basic and "annotated" machine code examples for use.

The board has proved to be particularly popular with schools and colleges throughout the country and is used for numerous applications from robotics, artificial intelligence and speech recognition, to controlling 30-ton pneumatic hammers, security systems and laboratory experiments.

Dr Mark Varney
Electroanalytical Technology
8 Access Road
West Derby
Liverpool L12 4YN

Secure program

FOR SOME time I have been trying to "secure" a program using information from your magazine such as that to disable the LIST, LLIST and break keys. I have even included a subroutine to "cold start" on reset and have tried the "run-on-error" routine printed in the magazine but this has the effect of freezing the machine rather than running it (but at least it presents access to the program).

Here is a subroutine I use to input from the keyboard. If INPUT is used the break key successfully breaks the program:

```
10000 A$=INKEY$: IF A$="" THEN 10000
10001 IF A$=CHR$(13) THEN RETURN
10002 PRINT A$;
10003 AI$=AI$+A$ 'to create strings
10004 GOTO 10000
```

Using the VAL function to convert the string to a number if necessary. For example:

```
50 PRINT @ 65, "ENTER FIRST NUMBER";:GOSUB 10000:A=VAL (AI$):AI$=""
   (AI$="" clears the string variable for next input)
60 PRINT @ 97, "ENTER SECOND NUMBER";:GOSUB 10000:B=VAL (AI$):AI$=""
```

Note the semi-colon after the print string to ensure that the key pressed is printed after the request to enter. This should be omitted if the keypress is to be printed on the line below.

Using a similar subroutine (omitting line 10002) to input an entry code to use the program or even to "enable" break so that only I can break the program I think I have finally "secured" it.

Richard Gunn
Swansea
W Glamorgan

ITT answer

WITH REFERENCE to Gerald Woodward's letter (October, *Dragon User*), I too purchased the same model ITT TV/Monitor and initially had the same problem.

I finally solved it by trial and error and using the pin connection diagrams provided with the TV and also Dragon Data's "Information for machine code users".

I have used a 5-pin DIN plug with 2 × twin core wires connected to the Dragon's monitor output, one to pins 3 and 2 for the video, and the other to pins 1 and 2 for sound (2 being earth). These are connected to the TV as follows:

Video signal to the SO 239 UHF socket with the outer section as earth. The sound signal is taken to the Audio In socket with the top pin as earth and the second wire connected to the lower Audio-Signal Input.

The volume setting on the TV has to be set fairly high to obtain a normal sound level.

John Nash
Sheringham
Norfolk

Jolly good news

FOLLOWING a recent article in your publication regarding the Valuepacks, we have had a number of letters from Dragon users asking where they can purchase the pack.

Unfortunately, due to lack of dealer and distributor response and support, we will not be releasing this pack. However, as a special offer to your readers we would be quite happy for them to write to us for the individual games and instead of paying the normal £5.50 price from the retailer, they can obtain four games for £14.99.

The games are:
Leggitt, Pedro, Cosmic Cruiser, B.C. Bill.
We are also about to release Arcadia for the Dragon and we would include this game which will also retail for £5.50. The total for the five games will be £18.00. This means a saving of £7.00 on the five games.

Colin Ashby
Beau Jolly
19A New Broadway
Ealing
London W5 5AW

Across the Atlantic

I AM writing on behalf of Dragon users in the USA. The company that originally distributed the Dragon in America is no longer supporting the Dragon. There seems to be very little hardware or software available and as a dealer this leaves me and my Dragon customers in a spot.

In looking through your magazine I see many sources for products, but almost all of them are not distributed in the United States. I would be most interested in hearing from any companies that have a USA distributor or who want to give details on shipping products to America.

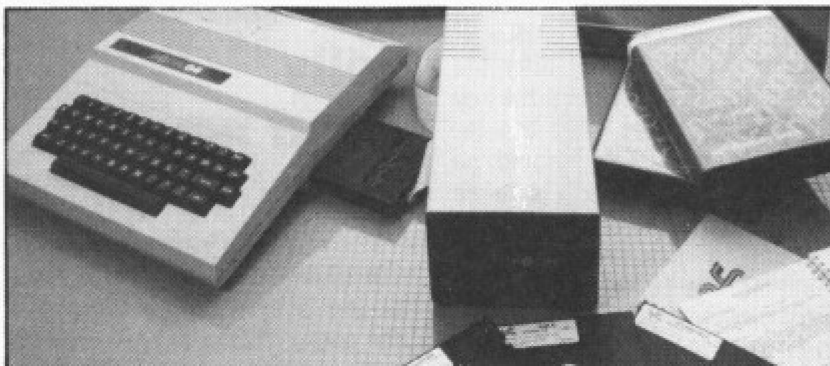
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Software Top 10

1	(5)	**Hunchback**	Ocean
2	(–)	**Mystery of the Java Star**	Shards
3	(6)	**Hungry Horace**	Melbourne House
4	(–)	**Mr Dig**	Microdeal
5	(–)	**Cuthbert in Space**	Microdeal
6	(–)	**Kriegspiel**	Beyond
7	(3)	**Chuckie Egg**	A & F
8	(–)	**Dragon Chess**	Oasis
9	(2)	**Ring of Darkness**	Wintersoft
10	(–)	**Eightball**	Microdeal

Chart compiled by Websters Software

GEC sells last stock



GEC HAS sold all of its existing stock of Dragon products and has no immediate plans to promote the Dragon. Denis Judd, marketing manager of GEC Radio and Television, said that all of GEC's stocks of the Dragon 32 and 64 had been sold to an undisclosed buyer, together with small quantities of single and double density disk drives. Delivery of the goods is to take place shortly.

It is not known what price was paid for the goods nor what price the products will be sold for when they eventually reach retail outlets.

It now looks as if GEC's association with the home computer market is in doubt. Although the company is in contact with Eurohard SA, the Spanish manufacturers of the Dragon, it has not yet come to any agreement over future marketing arrangments.

GEC has also shelved any immediate plans to manufacture an MSX computer. Denis confirmed that the company does not have a licence from Microsoft — the American licencees of the MSX standard.

One piece of good news, however, is that GEC is currently formulating plans to establish a Dragon repair and warranty service, possibly in conjunction with Touchmaster — the company formed by ex-Dragon Data directors Brian Moore and Richard Wadman.

The service, it is hoped, will cover Dragons sold both before and after the crash of Dragon Data earlier this year.

Dragon modem



A FULL facility modem, hardware-compatible with the Dragon, has just been released by Unicom for £49.95 excluding VAT. The modem features auto dial, auto redial, auto answer, auto band rate scan, full duplex, half duplex, bulletin board facility and number memory store.

Baud rates are 300/300, 1200/75 and 75/1200. Unfortunately, the company is not producing any software for the Dragon, so users of the system would have to write their own or rely on existing software provided by Cotswold Computers.

Cotswold has just released a new modem software package which features 40 column screen display with upper and lower case characters. The program also enables the facility to take a printed copy of incoming data.

The inclusion of a print facility is to allow the Dragon to emulate a telex terminal. By using the facilities of Easylink, the mailbox system operated by Cable and Wireless, it is possible to send and receive international and national telex messages at any time of the day or night. Further information from Cotswold Computers at 6 Middle Row, Chipping Norton, Oxfordshire.

New releases

MONSTERS, lightning bolts and ice palaces play a major part in some of the latest releases for the Dragon.

New from Cable Software in time for Christmas are three titles all retailing for £6.95 each. Fighting Fantasy is an arcade adventure with 35 screens which are in effect interconnected rooms. You move the character of a man by use of the joystick. Each room has different guards and objects to be overcome.

The game can be played either as an arcade game or an adventure. In order to reach the last screens, careful planning and thought is needed, according to Peter Philips of Cable Software. "You will need to plan a map in order to locate the keys needed to open subsequent doors. Also, various weapons are necessary to overcome opponents." The weapons include swords, lightning bolts and wizardry spells. "It is a very complex, full colour animated machine code game, which for any other micro would have been called a mega-game" according to Peter.

Cable's other two releases are Homebase — an arcade type game written in 100 per cent machine code which is a sort of "Lunar Jet Man", with you flying about on a rocket launcher firing at other craft; and an, as yet, untitled program involving nine different screens with revolving doors and a mad woman called Edna. Written in machine code it also is a multi-screen arcade game with full colour animation.

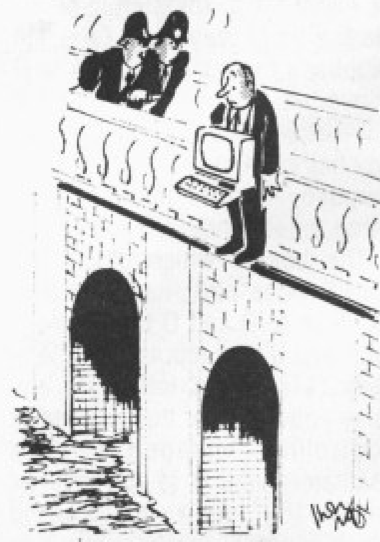
With every full price paid for a title from Cable Software users are being offered a free game from the following Cable titles: Living Stone, Geography, Drone, Dragrunner, Trace Race, Cave Fighter, Baccarat, Dragon Racer-Wasp Invasion. Two full price games will get you two free games. Further details from Cable Software (PSL Marketing) at 0582-591493.

Cambrian Computersolve, a new name to Dragon owners, is releasing its first title for the Dragon called Snowqueen. Retailing for £5.95 the game is based on Hans Christian Andersen's immortal story in which the boy Kay, is imprisoned by the Snow Queen in her palace of ice. He cannot gain his freedom until he can spell out the word ETERNITY from ice fragments taken from a lake of ice in the palace.

The game is a mixture of educational and "fun" and is set for ages around seven and above. Further details from Cambrian Computersolve at 15 Derwent Close, Prestatyn, Clwyd LL19 7TT.

Finally, from Knight Software comes Yumping Yosser who "yumps" his way to the top of each of fifteen screens making his way to the door, avoiding monsters and hoping for a reunion with his darling Daisy, and Time Attack from Tudor Williams, a low resolution military graphics game with torpedoes, mind probes, zeppelins and so on.

Further details from Knight Software at 93a High Street, Eston, Cleveland TS6 9JD and from Tudor Williams Software at 15 Summerhill Road, Coseley, West Midlands WV14 8RD.



"Looks like another computer firm going bust!"

Maintenance guaranteed

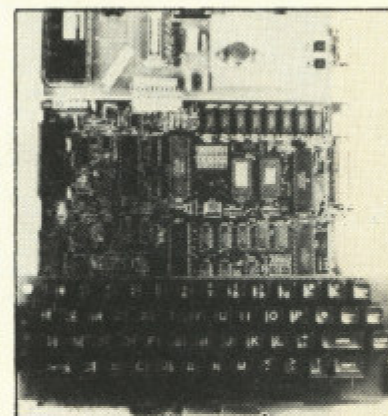
YEARLY maintenance warranties are being offered by two new firms in the computer industry.

Following the collapse of Dragon Data several months ago many readers have experienced trouble in getting their Dragon's repaired, especially with many service agents reportedly having difficulties in obtaining spare parts. Now Globel Computers and the Micro Repair Club are offering repair-guarantee packages which users can subscribe to when their manufacturer provided warranty runs out.

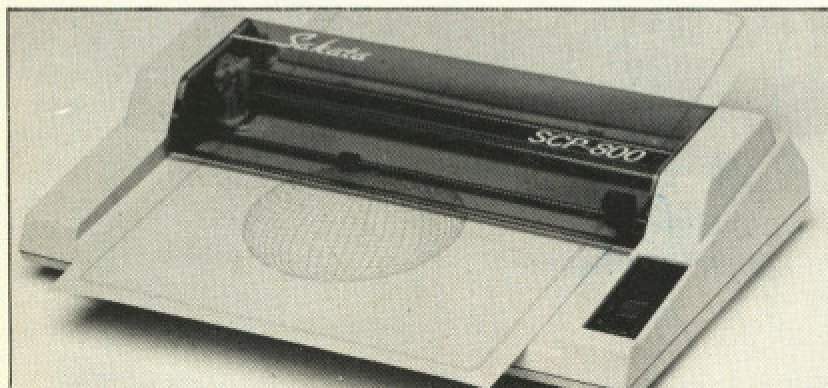
Globel's John Kensington stated that their engineers "are trained up to main frame computers" and are offering a warranty for one year, which covers all electronic components within the computer including the cost of all labour charges. If necessary, the company will replace a computer if it can't repair it. Globel charges £16.50 a year for a machine that is up to 24 months old and £20 per year for a machine that is over 24 months old. However, micros that are over 24 months need to be sent to the company to ensure that they are in "working condition".

The company will also repair micros that are already faulty, but again these must be sent to the company so that an appraisal and quotation can be obtained. For further details contact Globel Computer consultants at Charles House, Bridge Road, Southall, Middlesex UB2 4BD, telephone 01-571 4416.

Micro Repair is offering a similar service for £24.95. Renewal cost after the first year is £14.95, though the company is offering a four year subscription for £57.95. The maintenance work will be done by Computeraid Services, part of the Thorn EMI Information Technology Division.



Micro Repair also has a schools scheme whereby a school with more than one micro can join the club for a membership of £24.95 for the first micro and £19.95 each for all others. Further information about the warranty service can be obtained from Simon Jamison, Micro Repair Club, Swan Court, Mansel Road, Wimbledon, London SW19 4AA, telephone 01-946 7777.



THE SCP-800 printer plotter manufactured by Japanese firm Sakata Shokai is the first colour printer plotter to retail for under £200 according to Kevin Ledger, technical director of Datafax — the UK distributors of the SCP-800. The plotter has a standard Centronics interface and so should, according to Kevin, be compatible with the Dragon, though no tests have actually been made. There is also an RS-232C adaptor option. The printer plotter has A4 paper handling capability and a 210mm paper roll option. The recommended retail price is £199 though at present it is selling at an introductory price of £179. For further details contact Datafax at Datafax House, Bounty Road, Basingstoke, Hants RG21 3BX, telephone 0256-464187.

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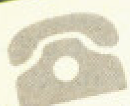
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Available for DRAGON 32 TANDY COLOUR 32K

Worlds of Flight



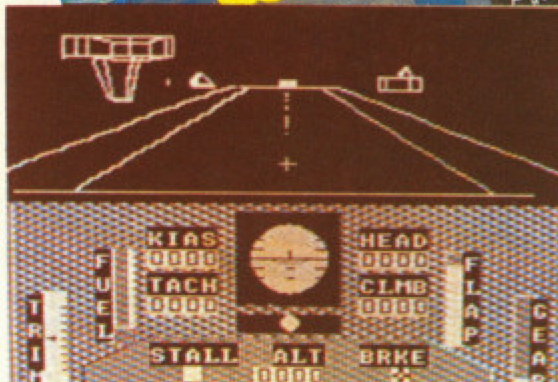
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Send details of your club to Clubs page, *Dragon User*, 12-13 Little Newport Street, London WC2R 3LD.

Nationwide network

***Gordon Ross** details the growing Users groups, including the latest national Dragon club*

A NEW national Dragon User group has been set up following the demise of Dragon Data, Dragon Dungeon and Computerhouse UK (formerly Games and Computers) each with their own newsletter/magazine.

The club has, as yet, no name, but with 230 members and half a dozen enquiries per week it is well on its way to becoming established. Negotiations are currently being made with a number of software firms regarding the possibility of the group offering discounted software. At present, there is a 30 per cent discount on titles produced by Snip Software, and it is hoped that both Microdeal and Touchmaster will be making their range of software available to group members at a 10 per cent saving.

The group is also consulting with Cotswold Computers about the possibility of obtaining the 2,000 list of members that Cotswold obtained from Computerhouse UK. Below we publish an extract from the editorial of the group's first newsletter:

The users group is being formed due to the demise of both Dragons Teeth and Dragon Data. Our beloved box of tricks is now in the hands of the perfidious Spanish and it was thought that some sort of voice was needed to promote our interests and exchange information. Which brings me to the main message of this editorial, any club — and especially a national one — can only survive with a large and active membership. THIS MEANS YOU, so if you have any problems, opinions, comments or contributions write in, also if you know anyone with a Dragon persuade them to join up, in short go forth and multiply.

Subscriptions for this year is set at £7.50, this may seem a bit steep, but with the club relatively small, costs are high, however next year we hope to be able to drop the price.

There has been some interest expressed in networking either by modem or RTTY, if anyone has views on this, or already possesses the equipment, let me know and I'll pass it on. That's enough from me, at least wearing this hat, so remember from here on in it's down to you.

Further details about the club can be obtained by sending an SAE or postage to the following: Jeremy Hoyland (newsletter editor), 17 Oxford Road, Frinton-on-Sea, Essex CO13 9HX. Paul Grade (club chairman), 6 Navarino Road, Worthing, Sussex. Kyffin Jones, 13 Bay View Road, Colwyn Bay, Clwyd LL29 8DW.■

Dragon clubnet

Bedfordshire: Leighton Buzzard Computer Club, Tiddenprot Leisure Centre, Leighton Buzzard. Small club, meets on Friday 8 pm to 10 pm — all systems welcome.

Berkshire: J R Griffin wants his small group to get bigger — write to 1 Garrard Road, Britwell Estate, Slough, Berkshire or telephone Slough 35268.

Brighton: Brighton, Hove & District Club meets every second Wednesday at the Southwick Community Centre from 7.30 to 10 pm — contact the Hon Secretary, 30 Leicester Villas, Hove, East Sussex BN3 5SQ.

Cornwall: 6809 User Group, c/o Paul Hills, 28 Woburn Road, Launceston, Cornwall — international postal group.

Devon: Brixham Computer meets every Wednesday evening at the Golden Lion, New Road, Brixham — write to Ian Chipperfield, 22 Brookdale Court, Brixham, Devon or telephone Brixham 59224.

Ellesmere: Gerard Corcoron, Ellesmere Port Micro group meets every second Monday and has a regular newsletter.

Essex: Doug Bourne, Dragon Independent Owners' Association, School House, Nevern Road, Rayleigh, Essex.

Hants: David Hedges, Independent Romsey Area Dragon User Group, 188 Rownhams Lane, North Baddesley, Romsey, Hants SO5 9LQ — regular meetings held every weekend and a free fortnightly newsletter is issued.

Hertfordshire: Paul Kennedy wants to form a Users' group. His address is 61 Broadmeads, Amwell End, Ware, Hertfordshire. Telephone Ware 68264.

Lancashire: Melvin Franklin, North West TRS-80 Users' group, 40 Cowlees, Westhoughton, Bolton, Lancashire — growing number of Dragon Users, meets every month at Irlam near Manchester and publishes newsletter.

Lancashire: John Schofield, Blackburn Computer Club, 1 Sutton Street, Feniscowles, Blackburn — meets every second Monday at 7.30 pm at the Fernhurst Hotel, Bolton Road, Ewood.

London: 68 Micro Group, 41 Pebworth Road, Harrow, Middlesex — publishes *68 Microcosm* and meets monthly at central London locations. Write to the group for further details — all 68XX owners welcome.

Nottinghamshire: Dragon User Group meets on Mondays at the Congregational Centre, Castle Gate, Nottingham — contact Mike Johnson, Rutland, 19 Gateford Close, Bramcote Moor, Beeston, Nottingham or telephone Nottingham 288541.

Oldham: Tony Walsh, Oldham Computer Users' Society, Coldhurst Community Centre, Dunbar Street, Rochdale, Oldham — an all-user club including 23 Dragon owners.

Staffordshire: Tony Beckedd, Tame Computer Club, 57 Adonis Close, Tamworth, Staffordshire — an all-user club including 15 Dragon owners, meets fortnightly.

Sunderland: Peter Theakstone would like to set up a Users' club for Dragon owners in the Sunderland area. Contact Peter on Sunderland 284188.

Worcestershire: Droitwich Computer Club meets in the Walnut Room of Norbury House on the first and third Wednesdays of each month — contact A R Middleton at 14 Primsland Drive, Cherry Hill Estate, Droitwich, Worcester, or telephone Droitwich 775570.

Yorkshire: OS-9 User Group, 1st Floor, 16 New North Parade, Huddersfield — meets monthly (alternating between a pub and Sheffield City Polytechnic) — contact Richard Crampton, 131 Herringthorpe Valley Road, Rotherham or telephone Rotherham 851545.

Channel Islands: Dragon User Group, c/o M J Buckle, Homestill, St Peter's Valley, St Lawrence, Jersey.

Northern Ireland: Edward Doak, North Down Microcomputer Users' Club, Bangor, Northern Ireland, telephone 0247-50902.

Scotland: David Anderson, Scottish Dragon Club, 1 Walker Street, Edinburgh.

Scotland: Stewart Hutchinson, 12A Firbank Terrace, Barrhead, Glasgow or telephone Glasgow 8805610.

Scotland: James Brown, Pennyburn Computer Users Club, 12 Newark Square, Pennyburn, Kilwinning, Ayrshire — meets every Monday and Tuesday evening from 6.30 to 9.30 pm.

United Kingdom: National Dragon users' group. Non-commercial group with approximately 250 members. Further details from Paul Grade, 6 Navarino Road, Worthing, Sussex. Send SAE or postage.

France: Stachnick Herve is looking for Dragon pen-pals to swap ideas and programs with. His address is 1 rue des Pivoines, 08000 Charlesville Mezieres, France.

Denmark: Dragon User Club, c/o Kenneth and Tonny Christensen, Toften 318, Dk-5330, Munkebo, Denmark.

Belgium: Maarten Van Wamelen, Dragon Users' Club, 3 Lijnmetestraat Oedelem (Beernem) 8330, Belgium.

Belgium: A. Timmermans, Rue des Combattants 4, 6110 Montiguy-le-Tillend, Belgium — operates a small Dragon club of about 20 members.

New Zealand: E G Coker wants to start a Dragon and Colour Computer Users' club — his address is 12 Collingwood Street, Whangarei, New Zealand.

South Africa: Ian McCall invites other SA Dragon owners to contact him at 35 Silwood Road, Rondebosch, Cape Town.

Dragonsoft

New software for review should be sent to *Dragon User*, 12-13 Little Newport Street, London WC2R 3LD.

Rampage

Program: Manic Miner, Software Projects, The Bear Brand Complex, Allerton Road, Woolton, Liverpool L25 7SF. **Price:** £5.50

ONE OF the most popular games to be released for the Spectrum was undoubtedly



Manic Miner; now Roy Coates has converted this game to run on the Dragon and it looks to be just as good on this machine. The only real difference from the original version is that the graphics are all black and white. This was a necessary drawback to maintain the same resolution as used on the Spectrum.

The object of the game is to guide miner Willy through the 20 screens, collecting objects as you go. The various screens include conveyor belts, rampaging toilets and bloodthirsty telephones. The sound effects are adequate and there's continual musical accompaniment, but as this is the same tune played over and over there is, thankfully, an option to turn off the music.

The only controls you have are left/right and jump, the keyboard is used and is unusually responsive; however, not including a joystick option these days seems rather strange.

This is a faithful reproduction of the Spectrum version and the fact that the graphics are black and white doesn't detract from the real appeal of this game — one for the collection.

Brian Cadge

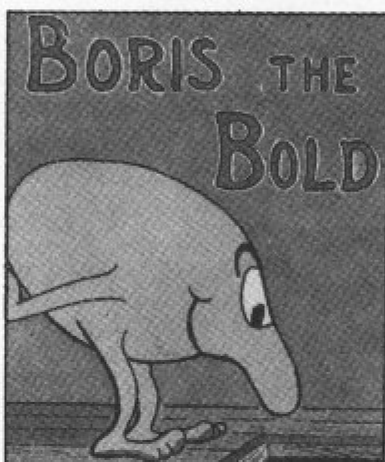


Back and forth

Program: Boris the Bold, Blaby Computer Games, 10 Crossways House, Lutterworth Road, Blaby, Leicester. **Price:** £1.99.

THE IDEA of this game is to get Boris down to the bottom of the screen through the holes that move backwards and forwards on the platforms while avoiding the various patrolling objects and collecting the diamonds for bonus points. The move from top to bottom must be made in a certain number of seconds (20 on the first screen, increasing by five on successive screens).

The game plays well, the response is good, the graphics move smoothly and the sound is the best I have heard on any Dragon game. However, unfortunately, the program has several blemishes that spoil its perfection. At the beginning of each go the scores and lives are zeroed for a second. This shows bad programming technique. Also, one of the hazards is what are called "Energy Bursts". These appear randomly on one of the levels and kill you if you happen to be where they are. They successfully remove 50 per cent of the skill in the game as there is no way to avoid them, or to predict where and when they are going to appear.



The program supports a pause facility and pressing break restarts a game, but the program performs a "cold start" on reset. Why can't programmers start their program with a NOP and set $72/73 (the reset vector) to this start address? It would save a lot of cursing and would offer more protection as the "cold start" poke can be recovered from very easily, and if the program, like this one, needs to be EXECuted after loading, piracy becomes very easy.

To summarise, a very good game, marred, though not beyond reprieve, by basic design faults. It is surprisingly addictive and is yet another case of a simple concept being a good one. Well worth adding to your collection.

Jason Orbaum



Money jump

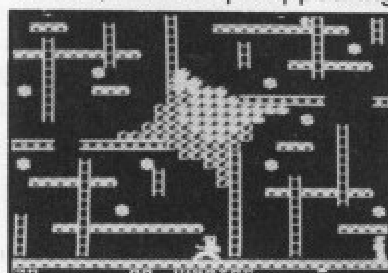
Program: Cashman, Microdeal, 41 Truro Road, St. Austell, Cornwall PL25 5JE. **Price:** £800

MANY so-called two-player games merely allow you to take it in turns to combat the opposition. Cashman is one of the few games where both players can battle it out on the screen at the same time.

The object of this entertaining program is to collect as much money as you can while avoiding the strange creatures that also inhabit the screen. At the start you can choose to control the sailor, who looks remarkably like Popeye, or the Sheik, or both of them if you have a partner, when you both try to collect more than the other.

Each location contains several conveyor belts and trampolines as well as carefully placed dollar signs. If you jump at the right time, the money is added to your total; when all the dollars have disappeared from the screen, a new location appears. Some of the animals you meet are friendly, such as birds that can fly you to the top of the display, but look out for cats who reduce your length of time in the game, as well as bombs and apples that descend on you with little warning. As you complete one screen, another appears that increases in difficulty, but if you prefer, you can choose at the start where to begin your challenge and miss out the easy screens.

The concept of the game is good, and in spite of the fact that the figures are difficult to control, it isn't too hard to get a high score. If you choose a late entry point in the game, however, it gets a lot more difficult, with ramps appearing



out of nowhere and worst of all, the loss of your ability to jump. This is the first time I have seen this arcade game on a home computer, and Microdeal appears to have a winner that should while away many an evening.

John Scriven



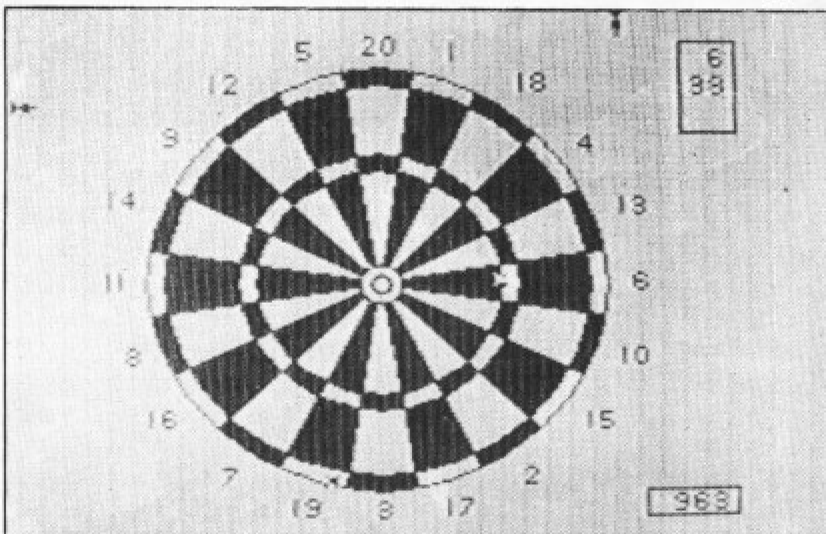
Bulls eye

Program: Darts, Blaby Computer Games, 10 Crossways House, Lutterworth Road, Blaby, Leicester. **Price:** £1.99

DARTS is a computerised version of the popular pub game. Up to nine players can take part using one or two joysticks. A variety of games are possible — 301, 501, and 1001, each with or without a double to start. There is a choice of nine difficulty levels which range from easy to impossible. An extra feature is the "own game" option which allows players to score for themselves or play some of the more unusual darts games sometimes found in pubs and clubs.

The darts are aimed by moving two pointers, one at

the top of the screen and one on the left. The intersection between the two pointers is where the dart is thrown when the fire button is pressed. If the player takes too long at aiming the dart, it is thrown automatically. The program displays each dart's score as well as the total left "to get", and before each turn, the player is reminded of his/her current score.



Darts is a well-thought-out game, ideal for those occasions when bus-loads of friends turn up demanding to play a computergame, and at £1.99 it's certainly cheaper than a dartboard. However, darts is a competitive game and so loses all of its appeal very quickly if played by only one person. It's a pity that the writers didn't include a "computer versus player" option which would increase the appeal of the program. That aside, it's a good game, and must represent excellent value for money.

David Rowntree



Laser racer

Program: Time Bandit, Microdeal, 41 Truro Road, St. Austell, Cornwall PL25 5JE. **Price:** £8.00



THIS IS a graphic adventure game that is in some ways similar to Touchstone, also from Microdeal. The initial display shows you some of the evil creatures you may meet on your way round the game as you attempt to collect a quantity of treasures.

There are many different locations in which this game is played; the difference is that the locations are not reached by travelling logically from one to the next, but by entering little time portals in the second frame and progressing through different mazes. You have a laser with which to protect yourself against the nasty things that live in the maze, but you are also racing against the clock to reach a key hidden somewhere in a tunnel that leads you back to the start with the treasure.



Playing the game reminded me a little of Jet Set Willy for the Spectrum, although each location takes up more than a while screen, and scrolls neatly to the left or right according to your movements. Each time the game is played, you pick up more ideas on how to reach the keys and treasures in less time, and manage to explore more places.

This game involves many skills, not just fast joystick fingers, and should appeal to a wide range of users.

John Scriven



Egg waves

Program: Demon Seed, Microdeal, 41 Truro Road, St. Austell, Cornwall PL25 5JE. **Price:** £4.99

AFTER many novel ideas, it seems a little strange to find Microdeal releasing a game as long in the tooth as this one. Based on the arcade favourite of two years ago, Phoenix, this is a well-written machine code version that seems heavily influenced by Hitchcock's masterpiece, the Birds. Only the graphics have been changed to protect the innocent.

The game starts with the traditional picture of Cuthbert grinning inanely as the rest of the program loads. There's enough time to go and make yourself a cup of coffee while this happens, and as you return the title frame appears together with the option to choose a black, buff or green background. There are no skill levels to choose from, and the first few frames present no great difficulties.

The theme is saving your base from alien destruction, this time in the form of a demonic foe that gathers at the top of the screen. The odd satanic budgie or two breaks off from the mob and swoops down on you as you blast away with your laser or move left and right to avoid it. If you succeed in destroying a screenful of these monsters, another wave appears followed by a squadron of cosmic eggs. These present more of a challenge, as they hatch out into ugly demons that need to have both wings and body destroyed before they disappear completely. Simply shooting off the wings results in a Phoenix-like reincarnation as another egg appears on the screen.

This is followed by other waves of eggs in different formations that prove rather more difficult to shoot down and occasionally the creatures fly up from below to catch you unawares. If you manage to survive this screen, you are soon offered the opportunity to destroy the mother ship.

In spite of a few reservations when I first played the game, I can see that Demon Seed has addictive potential, although it's hardly the most innovative program of the year.

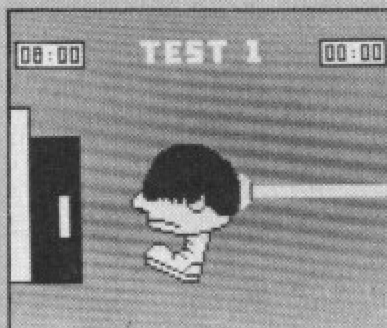
John Scriven



Gobble up

Program: Back Track, Incentive Software, 54 London Street, Reading RG1 4SQ. **Price:** £6.50

EDDIE is here! — Eddie being the name of the latest "computahero" from Chris Andrew of Incentive Software. Developed exclusively for the Dragon, this 100 per cent machine code high-resolution graphics game follows the fortunes of our hero Eddie as he explores a rambling labyrinth of interconnected rooms in an attempt to find the keys to the escape door. To aid him in his search is a map showing the plan of the maze, as well as items of food which he needs to top-up his energy reserves.



Unfortunately, there are also skeletons of previous victims to sap Eddie's strength, and snakes in his path to gobble him up completely, although these can be overcome with care. There are also other "nasties" lying in wait, but I won't deprive the reader of the pleasure of discovering these by mentioning them here. Unlike some games that are so fiendishly difficult that the novice is likely to become easily discouraged, this game can be played in its early stages at a quite leisurely pace, but, there is more in store!

There are no less than *five* mazes of increasing complexity, through which Eddie must be guided, using the cursor, or other user-definable keys. Complete all five, and answer the question on the competition form enclosed with the cassette and you stand a chance of winning a £300 disk drive system.

However, the most remarkable feature of this game is its three-dimensional display with some impressive changes of perspective as we move around taking a "bird's-eye" view of Eddie's peregrinations in and out of the rooms.

One minor carp — a joystick option would have been welcome but overall an excellent adventure at a realistic price.

Gordon Lee



SOME HAVE IT



If you've reached the stage where the restraints of your 6809 based computer are becoming a bore, cast your eye over this advertisement.

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THE CHIP SHOP

Keith and Steven Brain put you in touch with the Chip Shop with a look at two Basicode programs

ONE OF the current growth areas in microcomputing involves linking users together into various forms of network where they can transfer information and programs between their machines. Where the micros involved are of the same type this is relatively simple, but trying to get two different micros to converse can be rather like working for ACAS.

On the radio

Much has been written about Prestel and the "telesoftware" systems by which you can "buy" programs via your telephone and services such as Micronet and Compunet, but the developments in transmission of computer programs direct to the user by radio wave have had much less exposure. These are in many ways more interesting and exciting, not least because such programs are free to anyone who has a good old-fashioned "steam radio".

Those of you who listen to the BBC's regular Chip Shop program will probably already know the origin and purpose of the Basicode system, but for those who scorn mere audio entertainment we will briefly explain its development.

Way back in the dim dark beginnings of home micros (1978) the Dutch domestic radio service — Nederlandse Omroep Stichting (NDS) — first experimented with transmitting a computer program over the air. This proved technically successful and they therefore proceeded to regularly transmit programs on their weekly "Hobbyscoop" program. Some readers may also remember a test transmission made by the BBC TV "Tomorrows World" program consisting of short Apple and ZX81 programs.

Although the transmitted audio tones could be received accurately there were still a number of problems — not least of which was the fact that ordinary listeners complained about the terrible "interference" they seemed to be receiving. More seriously the value of the transmissions was very limited since almost every machine has a different cassette interface so that any particular broadcast was only potentially useful to a small group of people (this will be obvious to anyone who has listened to the various weird and wonderful tones produced by tapes for different machines). In addition it is not enough for the machine to be able to recognise that a signal is arriving at its cassette interface, as it must be able to translate this audio tone into a machine-readable format and then into a Basic program.

Although Basic is often seen as the computer-equivalent of "English" it's dialects are so many and varied that it reminds us of the quotation "England and the USA — two nations divided by a common language". Although it is a relatively simple matter to transmit data from one computer to another by the RS232 protocol this does *not* automatically provide conversion between different dialects of Basic. Even where a listing of the same program on different machines *looks* the same the internal representation ("tokens") may be different.

A Dutch radio amateur named Klaus Robers came up with the idea of a new independent code system which could be both "read" and "written" by a whole range of home computers. In this way a single broadcast could be simultaneously used by a range of machines. This idea was taken up by an interested group of users and thus Basicode was born. The system is often described as "Computer Esperanto" but as Esperanto is an artificial language which has had rather limited success, whereas Basicode is essentially a subset of Basic with a restricted vocabulary, we feel that "Pidgin Basic" describes it rather better.



Barry Norman, presenter of Radio 4's Chip Shop.

Further developments of the original idea have produced improvements and expansion of the system which has now passed through BASICODE2 to BASICODE2+. The system has attracted international interest and in addition to the Dutch broadcasts, Basicode programs are transmitted in the UK, USA, Canada, Australasia and throughout Europe.

To use the Basicode system you need to buy a special Basicode translation program for your computer. The major source of these is the BBC's Chip Shop program, through Broadcasting Support Services. Its new BASICODE2+ package provides a single tape containing suitable programs for no less than 13 different machines including, at last, the Dragon 32 and 64.

Providing the whole galaxy of programs on a single tape provides good value for money and fortunately the Dragon version is the first program on side 2, so that it is easy to locate. In addition to the tape a comprehensive 71 page manual is provided which gives a good introduction to all aspects of BASICODE.

The standard of this documentation is good, and should reduce most software (and hardware) manufacturers to sackcloth and ashes. Not only are the workings of all the versions of BASICODE explained but full details of the standard and how to write your own BASICODE programs are included.

In competition with the BBC version is an "alternative" offering from Mike Kerry of Grosvenor Software. The current version of this only allows you to load BASICODE programs, but further developments are in progress and it has a number of additional useful features which are described below.

Two tone

Two tones are used to record data onto the cassette at a baud rate of 1200. A logical "O" is defined as one full cycle of 1200 Hz, and a logical "1" as two full cycles of 2400 Hz. The transmission sequence is:

1 startbit (logic '0')
8 databits (least significant first)
2 stopbits (logic '1')

and a Basic program is coded in ASCII characters and not as the tokens used internally by the computer.

A checksum is included to detect errors in transmission. This works by performing an "exclusive-OR" on all the previous bytes in the block, and warns you if an error is present. If such errors are minor they may possibly be corrected by LISTing and EDITing the converted program. Once a program has been translated to Dragon Basic it can be saved and RUN in the normal way.

Both the BBC and Grosvenor packages are machine code routines loaded by the usual CLOADM command, and both sit in the Dragon hi-res graphics pages. As they start on page 2 they do not interfere with DragonDOS and either program can easily be transferred to disk.

As the graphics pages are occupied the normal screen enhancers such as "Rainbow Writer" or "Scribe" cannot be used *at the same time* as BASICODE (although they can usually be used in conjunction with converted programs.

A number of standard Subroutines are an essential part of Basicode and the functions of these are included as part of the translation program standard. They ▶

◀ vary between the two packages but essentially they adjust for the different ways in which the various Basic interpreters carry out a number of common tasks (see Table 1).

Lowest denominator

The main limitation of Basicode is that it has to take the lowest common denominator of the Basic of all the popular machines. This unfortunately means that the specialised sound and graphics facilities of particular machines cannot be used and you are therefore effectively limited to transmission of text.

The Basicode standard assumes a 40 row by 24 line screen, which obviously creates difficulties for the Dragon. Grosvenor Software has come up with one answer to this in its Basicode offering which allows you to see a 32 by 16 scrolling window on the total screen. It is also working on an alternative display which will use the hi-res graphics to produce the full 40 x 24 screen. As mentioned above it is possible to use one of the commercial hi-res displays once the program has been "crunched" into Dragon Basic, so that the limited display is really only a short-term problem.

The first step when reading Basicode is to decode the signal from the tape, and the second is to convert this into Dragon Basic format. The BBC version is very useful in that each character is displayed on the screen as it is received, so that errors in transmission are easily seen. This makes it very easy to set the correct volume level and so on. On the other hand the conversion routine also provides a running display, so that this part of the system is much slower than that of the Grosvenor version.

One disadvantage of the original Grosvenor program was that it gave up if it detected an error — so that a bad tape or transmission could be totally beyond salvage — but the latesi documentation provides some useful POKEs which allow you to attempt to resurrect "mortally-wounded" transmissions. On the BBC version you can easily toggle the MOTOR and AUDIO functions on or off by pressing a single key. In short the BBC is better if you are a novice and want to see what is happening, but the Grosvenor version gets you to your objective much faster if you already know that ycur recordings are OK.

Subroutine	Function	Dragon equivalent
GOSUB 100	Clear screen	(CLS)
GOSUB 110	Position cursor	(PRINT @)
GOSUB 120	Find cursor	
GOSUB 200	Key pressed?	(INKEY$)
GOSUB 210	Wait for key press	
GOSUB 250	Beep	(SOUND)
GOSUB 260	Random number	(RND)
GOSUB 270	Memory left	(MEM)
GOSUB 300	Number to string	(STR$)
GOSUB 310	Format number	(PRINT USING)
GOSUB 350	Output to printer	(PRINT£-2)
GOSUB 360	End line	

Table 1: Basicode subroutines.

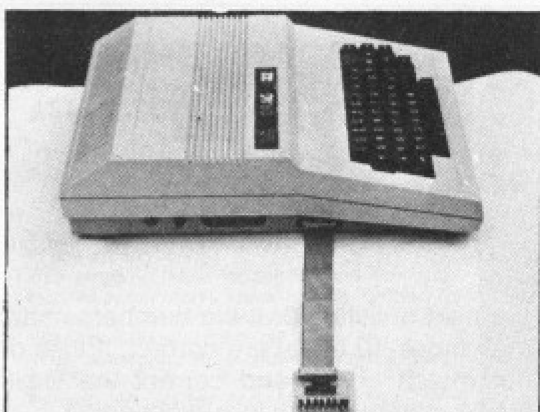
One major advantage of the BBC version is that it also allows you to convert Dragon programs to Basicode standard so that you can inflict them on your friend's machines, although Grosvenor apparently also has this side of things in the pipeline. As the Grosvenor version uses a machine code subroutine in it's "FORMAT NUMBERS (PRINT USING)" routine it must be present when programs using this facility (GOSUB 310) are RUN, which can be rather a nuisance.

Insomniacs

The BBC "Takeaway" service may be free but it rather assumes that computer users are either insomniacs or have a time controller on their tape recorder: The BBC have made much of their recent realocation of transmission times from around midnight to 5.55 am (gulp!) on Saturay and Sunday mornings but we are not sure if that is meant as a bad joke.

As we said before Basicode drags you down to the lowest common level, although the programs available may still be very interesting. Getting into Basicode does not cost an arm and a leg, is certainly cheaper than buying a modem, and will not send your telephone bill into orbit. So what have you got to lose if you give it a try?■

Basicode, Grosvenor Software, 22 Grosvenor Road, Seaford, East Sussex BN25 2BS. Price: £3.95 inc P&P.
Basicode 2+, Broadcasting Support Services, 2 Cater Road, Bristol BS13 7TW. Price: £4.95. Send an SAE measuring 8 x 10 inches to apply for an order form.



Versatile interfacing

***Brian Cadge** looks at a simple interface from NCJ Electronics*

SIMPLE is definitely the key word to this interface from NCJ Electronics. A short measure of ribbon cable connects the 1½ inch × 2½ inch pcb to the printer output of the Dragon.

Clear documentation

The idea behind the interface is to allow users to experiment with controlling simple external devices, such as leds, small motors or relays to drive larger devices. You effectively get eight output lines to use enabling up to eight independent devices to be controlled. Very clear documentation is provided, which includes an application example which drives four leds and four relays.

Accessing the interface is very simple, either from Basic using PRINT −2, or from machine code by calling the printer ROM routine at 48373.

The main component of the interface is a small chip which houses an eight-bit latch — similar to one "byte" of memory. This means, when a value is put on the input of the latch and the system is clocked (by the strobe connection from the Dragon), the output side of the latch takes on the new value and keeps it there until the chip is clocked again. This has the effect that the output is a steady configuration of '1's and '0's even though the input is constantly being changed by the Dragon doing other tasks, such as reading the keyboard. The BUSY line into the Dragon is kept at "Ready" so the computer doesn't hang up when you attempt to send data to the interface.

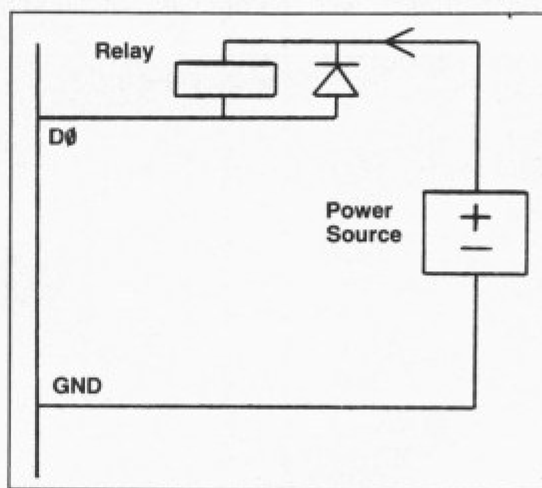


Figure 1

The possibilities for using this interface are numerous — for example, the Dragon could control the workings of a model railway, the signals, points and so on and all in "real time" using the Timer function of Basic. As the maximum load current is only 200ma, it would probably be necessary to wire most operations through relays. The circuit would be a simple one as shown in figure 1.

Very little electrical knowledge is needed to get the circuits working and this product is really ideal for anyone who wants to dabble in electronics, but is not sure enough to blow £50 on a full I/O interface. The interface costs £14.95 and is available from NCJ Electronics, 13 Binfield Square, Ella Street, Hull HU5 3AP.

Snakes alive

A pill-hungry snake game by ***Andrew Wond***

THIS IS A machine code game in which you control a pill-hungry snake around a maze using the right joystick. Every time a pill is eaten you gain 10 points and the snake grows longer. If a screen is cleared a bonus of 100 points is given. On every new screen the snake moves faster and the count-down timer quickens.

The score, timer and number of men are displayed at the top of the screen. If you run out of time or you bite yourself you lose one of your three lives. Press the fire button to start the snake.

To load the program first type in the Basic program (listing 1) which draws the maze and characters. Run this program and save the screen to tape using:
CSAVEM"SCREEN",1536,9215,1536

Machine code load

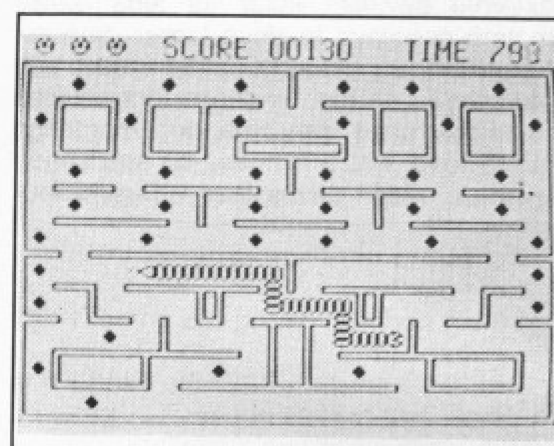
Switch your Dragon off then on again and type in the machine code loader (listing 2). Enter all the bytes from listing 3 into DATA statements from line 120 onwards. On running this program check each number with the numbers printed on the right of listing 3. If the numbers match then those 10 bytes are correct. If they do not match check and correct the Basic DATA statements before proceeding.

When the machine code has loaded correctly load in the screen using:
CLOADM"SCREEN"
Then save the complete program using:
CSAVEM"SNAKE",1536,11029,9500
Switch off and on again and CLOADM. To run the program type EXEC.

It is probably a good idea to save both Basic programs in case of disaster.

Listing 2

```
10 '********MACHINE CODE LOADER*********
20 PCLEAR7
30 FORI=9500 TO 11020 STEP10
40 PRINTI;
50 FORK=0 TO 9
60 READA$:A=VAL("&H"+A$)
70 POKE(I+K),A:SC=SC+A
80 NEXTK:PRINTSC:SC=0
90 B$=INKEY$:IFB$=""THEN90
100 IFB$=" "THENNEXTI
110 END
120 DATA 8E.04,00.86,60,A7,80,8C,06,etc
```



Listing 1

```
10 CLEAR400:PCLEAR5:PMODE4,1:PCLS1:SCREE
N1,0:COLOR0,1
20 DRAW"BM2,18R243D171L243U171
30 DRAW"BF3D165R237U165L237
40 DRAW"BF13R27D27L27U27BF3R21D21L21U21
50 DRAW"BR37BU3R51D3L24D24L27U27BF3R21D2
1L21U21
60 DRAW"BH3BR64U13D16R3U16C1BL1L1BR3C0
70 DRAW"BD29R23D11L24D16L3U16L24U11R51BG
3L44D5R44U5BE3
80 DRAW"BU16L11R51D27L27U24L24U3R51BG3D2
1L21U21R21BE3BR13R27D27L27U27BF3R21D21L2
1U21
90 DRAW"BH3BD40R27D3L27U3BL13L51R51D3L24
D16L3U16L24U3
100 DRAW"BL29L51D3R24D16R3U16R24U3
110 DRAW"BL64L27D3R27U3
120 DRAW"L27BD16R51D3L51U3
130 DRAW"BR80R51D3L51U3
140 DRAW"BR80R51D3L51U3
150 DRAW"BD16BR64L16D3R16BU1C1U1C0BU1BL2
9L179BL13ND3L16BD1C1D1C0BD1R16
160 DRAW"BR13NU3R88D16R3U16R88U3
170 DRAW"BD16R16D3L16D16L19U3R16U16R19BD
16L3R16BD1C1D1C0BD1L16NU3
180 DRAW"BU19BL29L59D3R16D16R11U16BL3D13
L5U13R5BR3R32U3
190 DRAW"L59BL29L59D3R32D16R11U16BL3D13L
5U13R5BR3R16U3
200 DRAW"L59BL13L19D3R16D16R19U3L16U16
210 DRAW"BL32BD16NR16BD1C1D1C0BD1R16NU3
220 DRAW"BD13BL3D19R43U16BL3D13L37U13R37
BR3R40BR16BR29R40D16R43U16BL3D13L37U13R3
7BR3U3L48U16L3D16L32ND3BL29BL16ND3L32U16
L3D16L48D3BR91
230 DRAW"BU16BL3U3R35D3L8D29R40D3L99U3R4
0U29L8BR11D29R13U29L13
240 PMODE0,5:PCLS1:PMODE4,2:COLOR0,1
250 DRAW"S4BM0,170BR1BU1F1R3E1U7H1L3G1D7
260 DRAW"BM8,170BR3R2L1U9G1
270 DRAW"BM16,170BR1NR5U3E1R3E1U3H1L3G1
280 DRAW"BM24,170BR1BU1F1R3E1U3H1NL2E1U2
H1L3G1
290 DRAW"BM32,170BR5U9G4D1R5
300 DRAW"BM40,170BR1BU1F1R3E1U4H1L4U3R5
310 DRAW"BM48,170BR1BU1F1R3E1U3H1L4D3U6E
1R3
320 DRAW"BM56,170BR1U2E5U2L5
330 DRAW"BM64,170BR1BU1F1R3E1U3H1L3H1U2E
1R3F1D2G1L3G1D3F1
340 DRAW"BM72,170BR2R3E1U7H1L3G1D3F1R4
350 A$="BU2NF2U3E2R3F2M-4,+1D1M+4,+1G2L3
BE1R0BU5R0":DRAW"BM88,168"+A$
360 DRAW"BM104,168BU7A1"+A$
370 DRAW"A0BM120,168BE7A2"+A$
380 DRAW"A0BM136,168BR7A3"+A$
390 B$="BU1F1R1E1U5H1L1G1D5BR4F1R1E1U5H1
L1G1D5":DRAW"BM152,168A0"+B$
400 DRAW"BM160,168BU7A1"+B$
410 C$="BU1U5R2M+5,+2D1M-5,+2L2":DRAW"BM
208,168A0"+C$
420 DRAW"BM224,168BU7A1"+C$
430 DRAW"BM176,168A0BE7A2"+C$
440 DRAW"BM192,168A0BR7A3"+C$
450 DRAW"BM240,168A0BR1BU3U1E2R1F2D1G2L1
H2":PAINT(244,165)
460 PMODE4,1:COLOR0,1
470 DRAW"BM64,15S4A0BR1BU1F1R3E1U3H1L3H1
U2E1R3F1
480 DRAW"BM72,15BR1BU1F1R3E1BU7H1L3G1D7
490 DRAW"BM80,15BR1BU1F1R3E1U7H1L3G1D7
500 DRAW"BM88,15BR1U9R4F1D3G1L4R1F4
510 DRAW"BM96,15BR1NR5U5NR4U4R5
520 DRAW"BM176,15BR3U9L3R6
530 DRAW"BM184,15BR1R2L1U9L1R2
540 DRAW"BM191,15U9M+3,+5M+3,-5D9
550 DRAW"BM200,15NR5U5NR4U4R5
```

Continued on page 21

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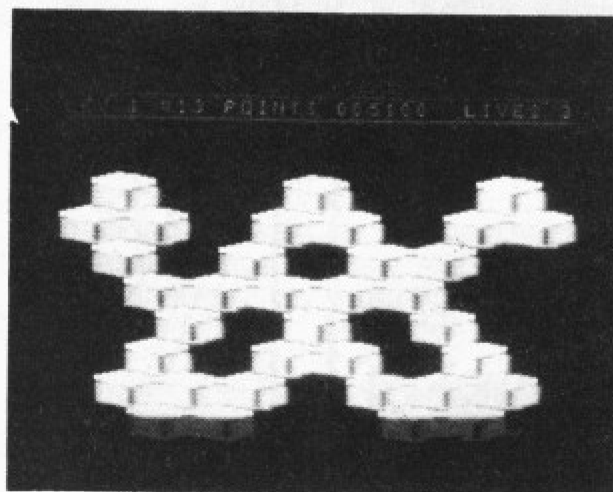
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Listing 3

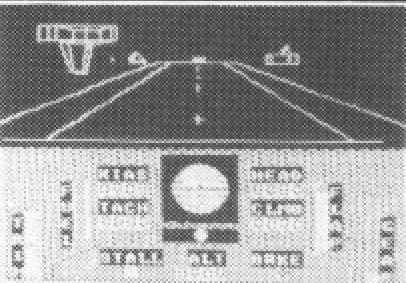
```
9500>8E 04 00 86 60 A7 80 8C 06 00  817
9510>26 F9 8E 04 8A 9F 88 8E 2A E5 1279
9520>BD 90 E5 8E 04 EA 9F 88 8E 2A 1421
9530>F1 BD 90 E5 8E 05 45 9F 88 8E 1456
9540>2A FD BD 90 E5 8E 00 C8 BF 29 1431
9550>A4 17 03 3B BD BB E5 81 47 26 1092
9560>04 86 F5 20 06 81 57 26 F1 86 1050
9570>FD B7 FF 22 86 F5 B7 FF C3 B7 1920
9580>FF C5 B7 FF C7 8E 00 64 BF 29 1563
9590>A4 CC 09 09 FD 2A 75 FD 2A 77 1212
9600>4F B7 2A 79 17 01 F5 8E 20 20  900
9610>10 8E 06 D2 C6 0A 17 02 51 8E  830
9620>20 31 10 8E 06 E1 C6 0A A6 84  976
9630>A7 A4 A7 22 A7 24 30 88 20 31 1000
9640>A8 20 5A 26 EF C6 0A F7 29 A2 1225
9650>86 03 B7 2A 74 17 03 08 17 03  538
9660>78 17 03 4F BD 80 12 7F 29 A7  895
9670>34 10 B6 29 A2 C6 FF 3D 1F 01  999
9680>30 8B 30 89 13 88 30 1F 26 FC  896
9690>35 10 B6 01 5A 81 35 22 2F 81  734
9700>0A 10 25 00 6F B6 01 5B 81 35  630
9710>10 22 00 F6 81 0A 10 25 00 A6  654
9720>17 01 B5 B6 2A 7A BB 2A 7B BB 1090
9730>2A 7C 26 BA 3E 01 F4 BF 29 A4 1173
9740>17 02 7E 16 03 5F 86 01 B7 29  630
9750>AA BE 29 A8 30 01 BC 29 AF 10 1038
9760>27 FF C6 BE 29 A8 A6 88 21 81 1355
9770>E7 26 0C 17 01 05 7D 29 A7 10  659
9780>26 FF B2 20 14 A6 88 61 8A 04 1064
9790>81 DF 10 27 FF A5 A6 88 61 81 1355
9800>FF 10 26 03 24 30 01 BF 29 A8  797
9810>17 01 A0 16 FF 91 86 03 B7 29  967
9820>AA BE 29 A8 30 1F BC 29 AF 10 1068
9830>27 FF 80 BE 29 A8 A6 88 1F 81 1283
9840>E7 26 0C 17 00 BF 7D 29 A7 10  844
9850>26 FF 6C 20 14 A6 88 5F 8A 20 1020
9860>81 FB 10 27 FF 5F A6 88 5F 81 1311
9870>FF 10 26 02 DE 30 1F BF 29 A8 1012
9880>17 01 5A 16 FF 4B 86 04 B7 29  828
9890>AA BE 29 A8 30 89 FF 00 BC 29 1238
9900>AF 10 27 FF 47 BE 29 A8 A6 88 1257
9910>C0 81 E7 26 0C 17 00 77 7D 29  910
9920>A7 10 26 FF 33 20 14 A6 88 A0 1041
9930>8A C3 81 C3 10 27 FF 26 A6 88 1307
9940>A0 81 FF 10 26 02 96 30 89 FF 1190
9950>00 BF 29 A8 17 01 10 16 FF 10  733
9960>86 02 B7 29 AA BE 29 A8 30 89 1114
9970>01 00 BC 29 AF 10 27 FE FD BE 1157
9980>29 A8 A6 89 01 20 81 E7 26 0C  955
9990>17 00 2C 7D 29 A7 10 26 FE E8  940
10000>20 16 A6 89 01 40 8A C3 81 C3 1079
10010>10 27 FE DA A6 89 01 40 81 FF 1279
10020>10 26 02 49 30 89 01 00 BF 29  547
10030>A8 17 00 C3 16 FE C3 34 10 17  948
10040>00 42 8E 00 32 BF 29 A4 17 01  678
10050>4A 7C 29 A6 7A 29 A3 27 03 35  826
10060>10 39 17 01 9E 17 01 BB 17 01  490
10070>6B 35 10 BE 29 A8 34 10 8E 00  785
10080>96 BF 29 A4 86 0A 34 02 17 00  767
10090>11 17 01 1F 35 02 4A 26 F3 17  505
10100>01 BF 35 10 7C 29 A7 39 8E 2A  834
10110>78 A6 84 81 09 27 04 6C 84 20  871
10120>09 6F 84 30 1F 8C 2A 74 26 ED  904
10130>86 04 10 8E 2A 74 31 A6 E6 A4 1063
10140>8E 20 20 30 85 10 8E 06 CD 31  805
10150>A6 C6 0A 17 00 38 4A 26 E5 39  851
10160>8E 2A 7C A6 84 27 04 6A 84 20  919
10170>0B 86 09 A7 84 30 1F 8C 2A 79  835
10180>26 ED 86 03 10 8E 2A 79 31 A6  948
10190>E6 A4 8E 20 20 30 85 10 8E 06  945
10200>DA 31 A6 C6 0A 17 00 04 4A 26  780
10210>E5 39 34 02 A6 84 A7 A4 30 88 1153
10220>20 31 A8 20 5A 26 F3 35 82 B6 1017
10230>29 AA 48 8E 20 29 30 86 10 BE  886
10240>29 A8 C6 08 17 FF DD B6 29 AE 1311
10250>81 03 25 02 80 02 8E 20 32 30  573
10260>86 10 BE 29 AC C6 08 17 FF C6 1235
10270>B6 29 AB 81 05 22 03 7C 29 A6  896
10280>7D 29 A6 27 08 7C 29 AB 7F 29  883
10290>A6 20 2C B6 29 AB C6 03 3D 83 1029
10300>00 03 8E 29 AC 3A 1F 13 10 AE  656
10310>84 8E 20 2C C6 08 17 FF 95 A6 1149
10320>5F 48 8E 20 34 30 86 33 5D 10  735
10330>AE C4 C6 08 17 FF 83 B6 29 AB 1379
10340>C6 03 3D 83 00 06 10 8E 29 AC  770
10350>31 AB EC A4 ED 23 A6 22 A7 25 1296
10360>31 3D 10 8C 29 A9 26 F0 BE 29  985
10370>A8 BF 29 AC B6 29 AA B7 29 AE 1363
10380>39 34 32 B6 FF 23 8A 08 B7 FF 1215
10390>23 8E 00 01 86 FD B7 FF 20 8D 1176
10400>1A 7F FF 20 8D 15 30 01 BC 29  880
10410>A4 25 ED B6 FF 23 84 F7 B7 FF 1727
10420>23 35 32 7F 01 13 39 1F 12 31  440
10430>3F 26 FC 39 86 34 B7 29 A3 8E 1125
10440>00 50 BF 29 A4 F6 29 A2 27 03  967
10450>7A 29 A2 CE 2A 7D 10 AE C4 31 1133
10460>A8 E0 8E 20 3E C6 08 17 FE FE 1365
10470>17 FF A4 33 42 4A 26 EA 39 8E 1104
10480>00 32 BF 29 A4 B6 29 AB CE 29 1087
10490>AC 10 AE C4 8E 20 2C C6 08 17 1005
10500>FE DE 17 FF 84 33 43 4A 26 ED 1353
10510>39 8E 1C 0F BF 29 A8 30 1F BF  912
10520>29 AC 30 1F BF 29 AF 86 01 B7 1017
10530>29 AA B7 29 AE B7 29 B1 4C B7 1269
10540>29 AB 7F 29 A6 17 FE C1 39 8E 1215
10550>00 64 BF 29 A4 B6 FF 00 8A 80 1199
10560>81 FE 26 F7 86 04 B7 2A 7C 7F 1282
10570>2A 7A 7F 2A 7B 7F 01 13 B6 01  786
10580>13 81 19 25 F9 17 FE 54 17 FF 1098
10590>2E 7D 2A 7C 26 EE 7F 2A 7A 7F 1031
10600>2A 7B 7F 2A 7C 17 FE 40 39 7A  978
10610>2A 74 8E 02 58 BF 29 A4 17 FF 1064
10620>10 26 2A 74 48 10 8E 06 E1 31  866
10630>A6 3E 20 2C C6 09 17 FE 55 17  975
10640>FF [illegible] 17 FF [illegible] [illegible] FF 9D B6 2A 1407
10650>74 10 27 FB D8 16 FC 1E FF FF 1452
10660>FF FF FF FF FF FF FF FF FF FF 2550
10670>FF FF FF BF DF FF FF FF FF BF 2390
10680>FF FF FF FF FF FF FF FF 89 89 2314
10690>81 81 83 81 81 81 91 81 81 81 1308
10700>81 81 81 81 81 83 89 89 89 89 1324
10710>89 89 99 89 89 89 99 89 89 89 1402
10720>DF FF FF FF FF DF FF FF FF FF 2486
10730>FF FF FF FF FF FF FF FF FF FF 2550
10740>FF FF FF FF FF FF FF FF FF FF 2550
10750>FF FF 93 89 81 81 81 A9 81 81 1608
10760>81 81 81 81 81 81 81 81 83 8B 1302
10770>89 89 89 89 89 89 89 89 89 89 1370
10780>8B 8B 89 A9 DF FF DF DF FF FF 2018
10790>DF DF FF FF FF FF FF FF DF FF 2454
10800>FF BF FF FF FF FF DF BF FF FF 2390
10810>FF FF FF FF DF FF 89 89 81 81 2030
10820>83 81 81 81 91 81 81 81 81 81 1308
10830>81 81 81 83 89 89 89 89 89 89 1340
10840>99 89 99 89 99 89 99 89 DF FF 1638
10850>DF DF FF FF DF DF FF FF FF FF 2422
10860>FF FF FF FF FF FF FF FF FF FF 2550
10870>FF FF FF FF FF FF FF 09 23 09 1838
10880>28 09 2C 09 32 09 36 09 3B 0B  294
10890>21 0B 26 0B 2C 0B 32 0B 38 0B  276
10900>3D 0E 23 0E 28 0E 2D 0E 31 0E  300
10910>36 0E 3B 10 23 10 28 10 2D 10  311
10920>31 10 36 10 3B 12 21 12 27 12  320
10930>2D 12 31 12 37 12 3D 14 21 14  337
10940>27 14 2C 14 32 14 37 14 3D 16  351
10950>21 16 25 16 2C 16 32 16 39 16  331
10960>3D 18 25 18 29 18 35 18 39 1A  371
10970>21 1A 2B 1A 33 1A 3D 1C 24 1C  358
10980>3A 20 53 4E 41 4B 45 2D 42 49  644
10990>54 45 00 20 42 59 20 41 2E 20  515
11000>57 4F 4E 44 00 20 47 52 45 45  635
11010>4E 20 4F 52 20 57 48 49 54 45  688
11020>3F 20 28 47 2F 57 29 00 89 00  518
```

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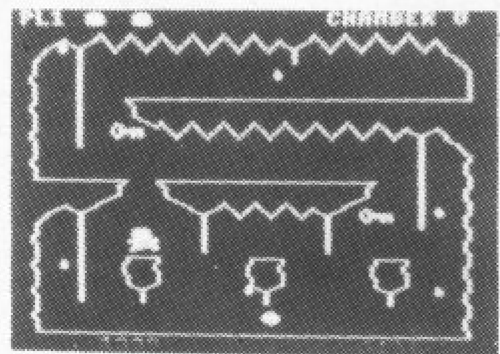
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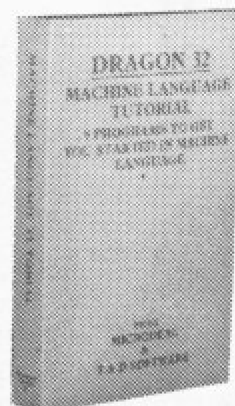
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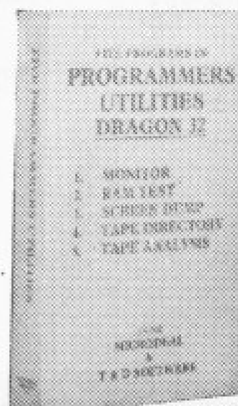
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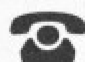
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Bookbytes

Send books for review to *Dragon User*, 12/13 Little Newport Street, London WC2R 3LD.

Book: *Brainteasers for the Dragon 32*
Author: Genevieve Ludinski
Publisher: Phoenix Publishing Associates
Price: £5.95

HERE ARE a number of programs covering an assortment of novel ideas, mainly of an educational nature, which enable us to test our skills at mental arithmetic, observation, cracking number codes, and finding our way through a couple of mazes — as well as a couple of mini-adventures thrown in.

Aimed mainly, I would think, at primary and secondary levels, the 22 routines are fairly simple and have been converted for the Dragon from material in companion volumes for other micros.



Unfortunately, it is in the conversion that problems arise. In order to use the character set in the hi-res mode, most of the listings contain one or *two* different subroutines, each of the two co-translators having used his own (different) routines. The length of the listings could have been reduced quite dramatically if they had agreed to use just one routine throughout, and had listed it just once at the beginning of the book, rather than repeating it in full in each program.

Indeed, a number of the programs would have been as effective — and much simpler — in low resolution graphics, and one or two might well have been omitted altogether. In particular, a "who-dunnit" mystery which turned out, rather disappointingly, to be an over-elaborate word matching exercise.

Illustrations which do not always match the listings, a number of typographical errors, and some rather quaint grammar give the impression of a hastily put together book. In particular, the author recommends that the REM statements be omitted to increase speed. My advice is don't as most GOTO's and GOSUB's are addressed to these lines and without them the programs will not run at all.

Gordon Lee

Book: *Giant book of games for your Dragon*
Authors: Tim Hartnell, Alan Blackman, Roger Bush, Robert Young
Publisher: Fontana
Price: £3.95

THERE ARE games to suit every taste in this book by Tim Hartnell and friends, ranging from Arcade to Adventure, Gambling to Simulation/role play. Each program has a page or so of introductory text which explains how to play and how the program works. The listings are taken directly from the printer and are very clear, so there should be no problems with typographic errors which have plagued books such as this in the past.



As usual, the quality of the games varies considerably, but overall the standard is quite high and many games utilise the Dragon's high and low resolution screens well.

As each game is invididually described, as well as a source of cheap games, typing in these programs will help you learn much about your computer and how to write programs. There are 28 games altogether, as well as useful appendices on creating moving graphics and error trapping. There is also a glossary of "Computerese" at the end of the book.

The *Giant Book of Games* is of the quality we hve come to expect from Tim Hartnell, and at £3.95 represents very good value for money.

Brian Cadge

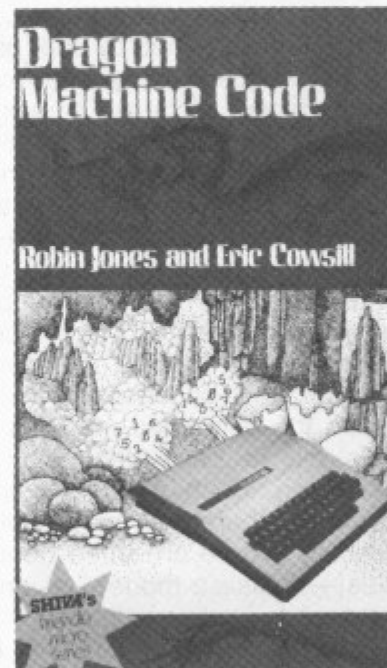
Book: *Dragon Machine Code*
Authors: Robin Jones and Eric Cowsill
Publisher: Shiva
Price: £6.95

THERE appears to be a third generation of computer books on the market. The first was the "Twenty Tremendous Games for your . . .", then, when the publishers realised that people didn't get much satisfaction typing in programs without learning from them, they produced scores of "Learning to program your . . ." where they re-printed all the listings and added thinly disguised re-written blocks of the manuals for the subject machine.

Also included was a "breakdown" of the program written at a totally different level to the rest of the text, making it impossible for the beginner to understand how the games worked, but allowing him or her the satisfaction of the painless (albeit useless) "learning experience" provided by such books. This new third generation appears to be showing some maturity, it is of course "Programming Machine Code on your . . .".

The book that is the subject of this review appears to have a strange blend of the excellent and the incredibly irritating. The main reason for this is it does not know the average intelligence quotient of its readership. I have been programming in machine code now for a long time, but I found some of the routines that were being used difficult to grasp. This is surely a fault of the text not explaining the listing in enough clarity.

The book contains a reasonably good introduction to programming for beginners, and the authors, Robin Jones and Eric Cowsill have avoided patronisation most of the time. The book provides its reader with a machine code monitor and a good chunk is devoted to high-resolution graphics, including a machine code routine to write text on the high-resolution screen at a tricky (to program that is) 51 by 24 character resolution. This alone makes the book worth consideration.



Sadly, though, the book has some glaring faults. Firstly, far too much emphasis is put on hand coding because, say the authors, assemblers cost too much. There is nothing more off-putting to a beginner than a series of tables and numbers. Also, very little help is given as to why things work, especially when dealing with graphics modes. Tables are given but the descriptions do not help the user to 'investigate'. Sound is not mentioned at any point, and Binary Coded Decimal appears to have disappeared from the face of the authors' earth.

All things considered, this is a good book to consider if you want to program your Dragon in machine code. However, in my opinion the authors Zak and Rosenthal produce books in a better class and this book is not Dragon specific enough to make it a worthwhile purchase over them. See it before you decide.

Jason Orbaum

Dreaming up Dragon designs

***David Sam** gives you the wherewithal to create your own designs*

MANY GAMES and other programs can be greatly improved and made more interesting by the addition of some good graphics. This is difficult to achieve purely from stringing a few graphics commands together and, by trial and error, finding the correct numbers. Very often a basically good game is ruined by poor graphics.

Designer is a comprehensive program that enables pictures, backgrounds and plans to be quickly and easily drawn. It allows you to access all of the Dragon's excellent graphics capabilities and also the normally missing text on the Hi-res screen.

On this version only the upper case letters and numbers are supported but other characters can easily be added in the necessary module of the program. The program itself consists of a main loop from which the command modules are called. This allows easy debugging and easy extension. Each module is independent and can therefore be modified without difficulty. There are three operating modules — Initialise mode, Design mode and Text mode.

Initialise Mode: There will be a short pause while the variables are being initialised. You will then be asked which PMODE you wish to work in and then which colour set. Next you are asked for the foreground colour.

In two colour modes the other colour defaults as the background colour while in four colour modes you are asked for the colour. The screen then goes into Hi-res and Design mode.

Design Mode: The joystick draws, moving the cursor in the current foreground colour. If the fire button is pressed than it only moves the cursor without affecting the background.

Variables

U,D,R,L, E,F,G,H,	Draw in the same direction as the corresponding DRAW statement. Commands.
Q	Enters initialise mode discarding the current screen.
Z	Ends the program.
;	Increases the scale factor by one i.e. step by which the cursor moves.
-	Decreases the scale factor by one.
0 to 8	Change the current foreground colour to the corresponding number if it is possible.
P	Paints the area from the cursor bordered by the colour given after its calling.
O	Draws a circle or an elipse around the cursor in the current foreground colour depending on the parameters given.
V	Displays all the variables that are user controlled.
/	Allows the use of the LINE statement and its options. The two points are positioned by the joystick and confirmed by pressing the fire button.
M	Moves an area of the screen of a user defined size and replaces it in one of four of the PUT statement options (excluding NOT). You must define the top left corners of each area in the same way as the "/" command. After both of these commands the cursor is still in its original position.
T	Saves the screen to tape.
S	Dumps the screen to a printer.
@	Enters text mode from design mode.

There is no delete command as you can erase lines by simply drawing over them in the background colour. The size of an area to be moved can be found by moving the cursor around the area and by also using the "V" command to find the X length and the Y length by the differences between the start and end co-ordinates.

Text Mode: The joystick moves the character position around the screen. The fire button shows the cursor but this affects the background as it flashes between the current foreground colour and the background colour set at initialise mode if the colour at that position is different. The cursor keys set the direction of printing the characters.

Variables

@	Returns control to design mode.
SPACE	Prints a space in the current direction.
A to Z and 0 to 9	Print the corresponding character in the current direction.
X, Y	These are the co-ordinates of the cursor.
COLOUR	This is the colour set being used.
FRGD	This is the colour that the cursor will draw in and the colour of the text. (i.e. foreground colour).
BACK	This is the background colour chosen in initilalise mode.
SCALE	This is the size of the steps that the cursor moves and the size of the text corresponding to the DRAW statement's "S" command values.
ANGLE	This is the current direction with values corresponding to the ones of the DRAW statement's "A" command.

The variables X and Y only are used in design mode while ANGLE is only used in text mode. COLOUR,FRGD,BACK, SCALE all apply to both modes. If the SCALE is too small then the cursor will not move properly. Again, there is no delete command. You can either overwrite the characters in the background colour or else use the "/" command to blank out a character position.

Program notes

Lines	
100 to 150	Initialise variables.
200 to 440	Main loop. (Design Mode). KEY$ holds the keyboard input. The cursor is flashed by inverting the point at X,Y by using the PUT statement and then repeating the process leaving the point the same.
1000 to 1540	Initialise Mode.
2000 to 2060	Change the foreground colour.
3000 to 3570	Text Mode.
3000 to 3060	Control loop
3070 to 3110	Joystick commands.
3120 to 3210	Check for accommodated characters.
3220 to 3310	Draw numbers.
3320 to 3570	Draw letters.
4000 to 4070	Clear screen.
5000 to 5050	Increase SCALE.
6000 to 6050	Decrease SCALE.
7000 to 7170	Move cursor and draw in foreground colour unless blank movement is specified.
8000 to 8050 and 9000 to 9050	Convert the joystick input for drawing.
10000 to 10120	Paint the area around the cursor.
11000 to 11310	Use the LINE statement.

12000 to 12090 Draw a circle or an elipse.
13000 to 13200 Display main variables.
14000 to 14150 Save the screen to tape.
15000 to 15520 Move an area of the screen.
16000 to 16200 Dump the screen to the printer.

This Basic screen dump is for a Seikosha GP-100A. If you are using a machine code screen dump then you must CLOADM it before line 60.

16000 to 16050 Converts the screen for the output routine.
16060 to 16200 Output routine.

In lines 16010 and 16190 there are two POKEs that put the Dragon into superfast mode and also return it to normal speed. Omit these lines if your machine does not accept the more common POKE & HFFD7,0. While in this mode, only the printer output is unaffected but everything else is, therefore, to prevent any spectacular crashes.

Line 16190 should be installed before testing this module. While this screen dump is running do not be alarmed by the garbage appearing on your screen as this is only a small side effect of the superfast mode.

The second listing shows the changes necessary if you do not have a joystick. You must also omit lines 8000 to 9050. This will give the following changes in instructions: In design mode the cursor keys will move the cursor without affecting the background. In text mode the shifted cursor keys will move the character position and the clear key will display the text cursor.

Readers who have any further questions, can write direct to the author at 11 Hawthorn Way, Chiswell Green, St Albans, Herts AL2 3BG. Also, for those of you who are put off by all the typing, a cassette containing copies of each version of the program on either side is available for £3 from the author. ■

```
10 REM ***DESIGNER***
20 REM GRAPHICS AND DESIGN
30 REM FOR PLANS AND PICTURES
40 REM (C) DEC. 1983  D.SAM
50 CLS
60 GOTO 200:REM CONTROL LOOP
70 REM    80 REM       90 REM
100 REM INITIALISE VARIABLES
110 DIM DUMMY(1),SHAPE(1200):X=0:Y=0:FRGD=0:BACK=0:COLOUR=0:REM SET UP HI RES SC
REEN DATA VARIABLES
120 SCALE=4:XOLD=0:YOLD=0:ANGLE=0:YNEW=0:XNEW=0:REM GLOBAL GRAPHICS VARIABLES
130 BOUNDRY=0:RADIUS=0:HW=0:START=0:FINISH=0:REM VARIABLES FOR CIRCLE AND PAINT
140 KEY$="":REM KEYBOARD INPUT STRING
150 RETURN
160 REM
170 REM
200 REM CONTROL LOOP
210 GOSUB 100:REM INITIALISE VARIABLES
220 GOSUB 1000:REM SET MODE AND COLOURS
230 PUT(X,Y)-(X,Y),DUMMY,NOT:KEY$=INKEY$:REM WAIT FOR INPUT FROM KEYBOARD OR JOY
STICK
240 PUT(X,Y)-(X,Y),DUMMY,NOT:IF KEY$="" AND JOYSTK(0)>13 AND JOYSTK(0)<50 AND JO
YSTK(1)>13 AND JOYSTK(1)<50 THEN 230
250 IF KEY$="Z" THEN CLS:SCREEN0,0:END
260 IF KEY$>="0" AND KEY$<="8" THEN GOSUB 2000:REM CHANGE FOREGROUND COLOUR
270 IF KEY$="Q" THEN RUN:REM RESTART DRAWING
280 IF KEY$="@" THEN GOSUB 3000:REM GO INTO CHARACTER MODE
290 IF KEY$="C" THEN GOSUB 4000:REM CLEAR SCREEN
300 IF KEY$=";" THEN GOSUB 5000:REM INCREASE SCALE FACTOR
310 IF KEY$="-" THEN GOSUB 6000:REM DECREASE SCALE FACTOR
320 IF KEY$="U" OR KEY$="D" OR KEY$="L" OR KEY$="R" OR (KEY$>="D" AND KEY$<="H")
 THEN GOSUB 7000:REM DRAW IN DIRECTION SPECIFIED
330 IF JOYSTK(0)>49 THEN GOSUB 8000:REM FIND WHICH DIRECTION OF JOYSTICK
340 IF JOYSTK(0)<14 THEN GOSUB 9000
350 IF JOYSTK(1)<14 AND JOYSTK(0)>14 AND JOYSTK(0)<50 THEN KEY$="U":GOSUB 7000:R
EM DRAW STRAIGHT UP OR DOWN
360 IF JOYSTK(1)>49 AND JOYSTK(0)>14 AND JOYSTK(0)<50 THEN KEY$="D":GOSUB 7000
370 IF KEY$="P" THEN GOSUB 10000:REM FIND AREA TO PAINT
380 IF KEY$="/" THEN GOSUB 11000:REM DRAW A LINE OR BOX
390 IF KEY$="O" THEN GOSUB 12000:REM DRAW A CIRCLE OR ELIPSE
400 IF KEY$="V" THEN GOSUB 13000:REM DISPLAY VARIABLES USED BY DESIGNER
410 IF KEY$="T" THEN GOSUB 14000:REM SAVE HI RES SCREEN
420 IF KEY$="S" THEN GOSUB 16000:REM SCREEN DUMP
430 IF KEY$="M" THEN GOSUB 15000:REM MOVE BLOCK OF SCREEN
440 GOTO 230
500 REM
510 REM ++++++++SUBROUTINES++++++++++
520 REM
1000 REM INITIALISE HI RES SCREEN
1010 CLS
1020 PRINT"WHICH MODE (0-4) ? ";
1030 MODE$=INKEY$
1040 IF MODE$="" THEN 1030
1050 IF MODE$>"4" OR MODE$<"0" THEN 1030
1060 PRINT MODE$
1070 MODE=VAL(MODE$)
1080 PRINT:PRINT
1090 PRINT"WHICH COLOUR SET (0/1) ? ";
1100 COLOUR$=INKEY$
1110 IF COLOUR$>"1" OR COLOUR$<"0" THEN 1100
1120 PRINT COLOUR$
1130 COLOUR=VAL(COLOUR$)
1140 PMODE MODE
1150 IF COLOUR=1 THEN CHOICE=1
1160 IF COLOUR=0 THEN CHOICE=2
1170 IF COLOUR=1 AND MODE/2<>INT(MODE/2) THEN CHOICE=3
1180 IF COLOUR=0 AND MODE/2<>INT(MODE/2) THEN CHOICE=4
1190 ON CHOICE GOSUB 1250,1300,1350,1450
1200 DRAW"BM"+STR$(X)+","+STR$(Y)
1210 COLOR FRGD,BACK:PCLS
1220 SCREEN 1,COLOUR
1230 RETURN    1240 REM
1250 PRINT"WHICH FOREGROUND COLOUR (0/5) ?"
1260 FRGD$=INKEY$:IF FRGD$="" THEN 1260
1270 IF FRGD$<>"0" AND FRGD$<>"5" THEN 1260 ELSE FRGD=VAL(FRGD$)
1280 IF FRGD=0 THEN BACK=5 ELSE BACK=0
1290 RETURN
1300 PRINT"WHICH FOREGROUND COLOUR (0/1) ?"
1310 FRGD$=INKEY$:IF FRGD$="" THEN 1310
1320 IF FRGD$>"1" OR FRGD$<"0" THEN 1310 ELSE FRGD=VAL(FRGD$)
1330 IF FRGD=0 THEN BACK=1 ELSE BACK=0
1340 RETURN
1350 PRINT"WHICH FOREGROUND COLOUR (5-8) ?";
1360 FRGD$=INKEY$:IF FRGD$="" THEN 1360
1370 IF FRGD$<"5" OR FRGD$>"8" THEN 1360
1380 PRINT FRGD$
1390 FRGD=VAL(FRGD$)
1400 PRINT"WHICH BACKGROUND COLOUR (5-8) ?"
1410 BACK$=INKEY$:IF BACK$="" THEN 1410
1420 IF BACK$>"8" OR BACK$<"5" THEN 1410
1430 BACK=VAL(BACK$)
1440 RETURN
1450 PRINT"WHICH FOREGROUND COLOUR (1-4) ?";
1460 FRGD$=INKEY$:IF FRGD$="" THEN 1460
1470 IF FRGD$>"4" OR FRGD$<"1" THEN 1460
1480 PRINT FRGD$
1490 FRGD=VAL(FRGD$)
1500 PRINT"WHICH BACKGROUND COLOUR (1-4) ?"
1510 BACK$=INKEY$:IF BACK$="" THEN 1510
1520 IF BACK$<"1" OR BACK$>"4" THEN 1510
1530 BACK=VAL(BACK$)
1540 RETURN
1550 REM
1560 REM
2000 REM CHANGE FOREGROUND COLOUR TO THE ONE SPECIFIED
2010 FRGD=VAL(KEY$)
2020 IF MODE/2<>INT(MODE/2) AND COLOUR=0 AND FRGD<=4 AND FRGD>=1 THEN COLOR FRGD
,BACK
2030 IF MODE/2<>INT(MODE/2) AND COLOUR=1 AND FRGD<=8 AND FRGD>=5 THEN COLOR FRGD
,BACK
2040 IF MODE/2=INT(MODE/2) AND COLOUR=0 AND (FRGD=1 OR FRGD=0) THEN COLOR FRGD,B
ACK
2050 IF MODE/2=INT(MODE/2) AND COLOUR=1 AND (FRGD=0 OR FRGD=5) THEN COLOR FRGD,B
ACK
2060 RETURN
2070 REM
2080 REM
3000 REM CHARACTER MODE FOR TEXT ON HI RES SCREEN
3010 KEY$=INKEY$:REM WAIT FOR INPUT FROM KEYBOARD OR JOYSTICK
3020 IF (PEEK(65280) AND 1)=0 THEN DRAW"RC"+STR$(BACK)+"LC"+STR$(FRGD):REM FLASH
 CURSOR
3030 IF KEY$="" AND JOYSTK(0)>14 AND JOYSTK(0)<50 AND JOYSTK(1)>14 AND JOYSTK(1)
<50 THEN 3000
3040 IF KEY$="@" THEN DRAW"A0BM"+STR$(INT(X))+","+STR$(INT(Y)):RETURN:REM RESET
FOR GRAPHICS MODE
3050 IF KEY$="" THEN GOSUB 3070 ELSE GOSUB 3120
3060 GOTO3000
3070 IF JOYSTK(0)>50 THEN DRAW"A0BR8A"+STR$(ANGLE)
3080 IF JOYSTK(0)<14 THEN DRAW"A0BL8A"+STR$(ANGLE)
3090 IF JOYSTK(1)<14 THEN DRAW"A0BU8A"+STR$(ANGLE)
3100 IF JOYSTK(1)>50 THEN DRAW"A0BD8A"+STR$(ANGLE)
3110 RETURN
3120 IF KEY$="^" THEN ANGLE=3
3130 IF KEY$=CHR$(10) THEN ANGLE=1
3140 IF KEY$=CHR$(8) THEN ANGLE=2
3150 IF KEY$=CHR$(9) THEN ANGLE=0
3160 DRAW"A"+STR$(ANGLE)
3170 IF KEY$=" " THEN DRAW"BR6"
3180 KEY=ASC(KEY$)
3190 IF KEY>=48 AND KEY<=57 THEN ON (KEY-47) GOSUB 3220,3230,3240,3250,3260,3270
,3280,3290,3300,3310
3200 IF KEY>=65 AND KEY<=90 THEN ON (KEY-64) GOSUB 3320,3330,3340,3350,3360,3370
,3380,3390,3400,3410,3420,3430,3440,3450,3460,3470,3480,3490,3500,3510,3520,3530
,3540,3550,3560,3570
3210 RETURN
3220 DRAW"BM+0,-2F2RE2U2H2LG2D2BM+8,+2":RETURN
3230 DRAW"BRU6GBM+6,+5":RETURN
3240 DRAW"BR4L4UER2EU2HL2GBM+8,+5":RETURN
3250 DRAW"BM+0,-1FR2EUHL2R2EUHL2GBM+8,+5":RETURN
3260 DRAW"BM+0,-3NU3R4NU3D3BM+4,+0":RETURN
3270 DRAW"BUFR2EU2HL3U2R4BM+4,+6":RETURN
3280 DRAW"BU2ER2FDGL2HU4ER2FBM+4,+5":RETURN
3290 DRAW"BR2U2E2U2L4BM+8,+6":RETURN
3300 DRAW"BRR2EUHL2HUER2FDGL2GDFBR7":RETURN
3310 DRAW"BUFR2EU4HL2GDFR3BM+4,+3":RETURN
3320 DRAW"U5ER2FD2NL4D3BM+4,+0":RETURN
3330 DRAW"U6R3FDGFDGL3U3R3BM+5,+3":RETURN
3340 DRAW"BRHU4ER2FHL2GD4FR2EBM+4,+1":RETURN
3350 DRAW"U6R2F2D2G2L2BR8":RETURN
3360 DRAW"NR4U3NR3U3R4BM+4,+6":RETURN
3370 DRAW"U3NR3U3R4BM+4,+6":RETURN
3380 DRAW"BRR2EULRDGL2HU4ER2FBM+4,+5":RETURN
3390 DRAW"U3NU3R4NU3D3BM+4,0":RETURN
3400 DRAW"BRU6BM+5,+6":RETURN
3410 DRAW"BUFR2EU5BM+4,+6":RETURN
3420 DRAW"U3NU3RNE3F3BM+4,0":RETURN
3430 DRAW"NR4U6BM+8,+6":RETURN
3440 DRAW"U6F2E2D6BR4":RETURN
3450 DRAW"U6DF4DU6BM+4,+6":RETURN
3460 DRAW"U6R4D6L4BR8":RETURN
3470 DRAW"U6R3FDGL3BM+8,+3":RETURN
3480 DRAW"BRRE2U3HL2GD4FBM+1,-2F2BM+4,+0":RETURN
3490 DRAW"U6R3FDGL3RF3BR4":RETURN
3500 DRAW"BUFR2EH4ER2FBM+4,+5":RETURN
3510 DRAW"BR2U6NL2R2BM+4,+6":RETURN
3520 DRAW"BU6D5FR2EU5BM+4,+6":RETURN
3530 DRAW"BU6D4F2E2U4BM+4,+6":RETURN
3540 DRAW"NU6E2F2U6BM+4,+6":RETURN
3550 DRAW"UE4UBD6UH4UBM+8,+6":RETURN
3560 DRAW"BR2U3H2UDF2E2UBM+4,+6":RETURN
3570 DRAW"NR4UE4UL4BM+8,+6":RETURN
3580 REM      3590 REM
4000 REM CLEAR HI RES SCREEN
4010 SCREEN0,1
4020 CLS
4030 PRINT"CLEAR SCREEN.SURE (Y/N) ?"
4040 KEY$=INKEY$:IF KEY$="" THEN 4040
4050 IF KEY$="Y" THEN PCLS:SCREEN 1,COLOUR:RETURN
4060 IF KEY$="N" THEN SCREEN 1,COLOUR:RETURN
4070 GOTO4040
4080 REM
4090 REM
5000 REM INCREASE SCALE FACTOR
5010 SCALE=SCALE+1
5020 IF SCALE>62 THEN SCALE=62
5030 SHAPE$="S"+STR$(SCALE)
5040 DRAW SHAPE$
5050 RETURN
5060 REM
5070 REM
6000 REM DECREASE SCALE FACTOR
6010 SCALE=SCALE-1
6020 IF SCALE<1 THEN SCALE=1
6030 SHAPE$="S"+STR$(SCALE)
6040 DRAW SHAPE$
6050 RETURN
6060 REM     6070 REM
7000 REM DRAW IN DIRECTION SPECIFIED BY KEY$
7010 IF (PEEK(65280) AND 1)=0 THEN KEY$="B"+KEY$:REM BLANK MOVE IF BUTTON PRESSE
D
7020 DRAW KEY$
7030 KEY$=RIGHT$(KEY$,1):REM UPDATE CURRENT POSITION POINTER
7040 IF KEY$="U" THEN Y=Y-SCALE/4
7050 IF KEY$="D" THEN Y=Y+SCALE/4
7060 IF KEY$="R" THEN X=X+SCALE/4
7070 IF KEY$="L" THEN X=X-SCALE/4
7080 IF KEY$="E" THEN Y=Y-SCALE/4:X=X+SCALE/4
7090 IF KEY$="F" THEN Y=Y+SCALE/4:X=X+SCALE/4
7100 IF KEY$="G" THEN Y=Y+SCALE/4:X=X-SCALE/4
7110 IF KEY$="H" THEN Y=Y-SCALE/4:X=X-SCALE/4
7120 IF X<0 THEN X=0
7130 IF X>255 THEN X=255
```

Continued on page 27

```
7140 IF Y<0 THEN Y=0
7150 IF Y>191 THEN Y=191
7160 X=INT(X+.5):Y=INT(Y+.5):DRAW"BM"+STR$(X)+","+STR$(Y)
7170 RETURN
7180 REM
7190 REM
8000 REM FIND DIRECTION AT RIGHT OF JOYSTICK
8010 KEY$="R"
8020 IF JOYSTK(1)>49 THEN KEY$="F"
8030 IF JOYSTK(1)<14 THEN KEY$="E"
8040 GOSUB 7000:REM DRAW IN CORRECT DIRECTION
8050 RETURN
8060 REM
8070 REM
9000 REM FIND DIRECTION AT LEFT OF JOYSTICK
9010 KEY$="L"
9020 IF JOYSTK(1)>49 THEN KEY$="G"
9030 IF JOYSTK(1)<14 THEN KEY$="H"
9040 GOSUB 7000:REM DRAW IN CORRECT DIRECTION
9050 RETURN
9060 REM
9070 REM
10000 REM PAINT A SPECIFIED AREA WITH THE SPECIFIED COLOUR
10010 CLS
10020 SCREEN 0,0
10030 XNEW=X:YNEW=Y
10040 PRINT"COLOUR TO BORDER AREA ?";
10050 BORDER$=INKEY$:IF BORDER$="" THEN 10050
10060 BORDER=VAL(BORDER$)
10070 SCREEN 1,COLOUR
10080 IF MODE/2<>INT(MODE/2) AND COLOUR=0 AND BORDER>=1 AND BORDER<=4 THEN PAINT
(XNEW,YNEW),FRGD,BORDER
10090 IF MODE/2<>INT(MODE/2) AND COLOUR=1 AND BORDER>=5 AND BORDER<=8 THEN PAINT
(XNEW,YNEW),FRGD,BORDER
10100 IF MODE/2=INT(MODE/2) AND COLOUR=0 AND (BORDER=0 OR BORDER=1) THEN PAINT(X
NEW,YNEW),FRGD,BORDER
10110 IF MODE/2=INT(MODE/2) AND COLOUR=1 AND (BORDER=0 OR BORDER=5) THEN PAINT(X
NEW,YNEW),FRGD,BORDER
10120 RETURN
10130 REM
10140 REM
11000 REM DRAW A LINE OR A BOX AT SPECIFIED POSITIONS
11010 CLS:SCREEN0,0
11020 PRINT"(1) LINE","(2) RESET LINE","(3) BOX","(4) RESET BOX","(5) FILL","(6)
 RESET FILL"
11030 KEY$=INKEY$:IF KEY$="" THEN 11030
11040 CHOICE=VAL(KEY$)
11050 IF CHOICE<1 OR CHOICE>6 THEN 11030
11060 XNEW=X:YNEW=Y
11070 FOR WW=1TO2
11080 SCREEN 1,COLOUR
11090 PUT(XNEW,YNEW)-(XNEW,YNEW),DUMMY,NOT
11100 PUT(XNEW,YNEW)-(XNEW,YNEW),DUMMY,NOT
11110 XNEW=XNEW+(JOYSTK(0)<14 AND XNEW>0)-(JOYSTK(0)>50 AND XNEW<255)
11120 YNEW=YNEW+(JOYSTK(1)<14 AND YNEW>0)-(JOYSTK(1)>50 AND YNEW<191)
11130 IF (PEEK(65280) AND 1)=1 THEN GOTO 11090
11140 IF WW=1 THEN XOLD=XNEW:YOLD=YNEW
11150 SOUND 100,3
11160 NEXTWW
11170 ON CHOICE GOSUB 11200,11220,11240,11260,11280,11300
11180 RETURN
11190 REM
11200 LINE(XOLD,YOLD)-(XNEW,YNEW),PSET
11210 RETURN
11220 LINE(XOLD,YOLD)-(XNEW,YNEW),PRESET
11230 RETURN
11240 LINE(XOLD,YOLD)-(XNEW,YNEW),PSET,B
11250 RETURN
11260 LINE(XOLD,YOLD)-(XNEW,YNEW),PRESET,B
11270 RETURN
11280 LINE(XOLD,YOLD)-(XNEW,YNEW),PSET,BF
11290 RETURN
11300 LINE(XOLD,YOLD)-(XNEW,YNEW),PRESET,BF
11310 RETURN
11320 REM
11330 REM
12000 REM DRAW A CIRCLE OR AN ELIPSE AT SPECIFIED LOCATION
12010 SCREEN 0,0
12020 CLS
12030 INPUT"RADIUS";RADIUS
12040 INPUT"HEIGHT:WIDTH RATIO";HW
12050 INPUT"START";START
12060 INPUT"FINISH";FINISH
12070 SCREEN 1,COLOUR
12080 CIRCLE(X,Y),RADIUS,FRGD,HW,START,FINISH
12090 RETURN
12100 REM
12110 REM
13000 REM DISPLAY VARIABLES
13010 CLS
13020 SCREEN 0,0
13030 PRINT"VARIABLE","VALUE"
13040 PRINT
13050 PRINT"XCOORD",X
13060 PRINT
13070 PRINT"YCOORD",Y
13080 PRINT
13090 PRINT"SCALE",SCALE
13100 PRINT
13110 PRINT"ANGLE",ANGLE
13120 PRINT
13130 PRINT"COLOUR SET",COLOUR
13140 PRINT
13150 PRINT"FOREGROUND",FRGD
13160 PRINT
13170 PRINT"BACKGROUND",BACK;
13180 IF INKEY$="" THEN 13180
13190 SCREEN 1,COLOUR
13200 RETURN
13210 REM
13220 REM
14000 REM SAVE SCREEN
14010 CLS
14020 SCREEN0,0
14030 PRINT"POSITION DATA TAPE"
14040 PRINT"PRESS RETURN TO SAVE SCREEN"
14050 MOTORON
14060 IF INKEY$<>CHR$(13) THEN 14060
14070 MOTOROFF
14080 INPUT"NAME OF SCREEN";NS$
14090 SCREND=INT((MODE+1)/2)
14100 IF SCREND=0 THEN SCREND=1
14110 CSAVEM NS$,&H600,((&H600*SCREND)-1),&H600
14120 SCREEN1,COLOUR
14130 RETURN
14140 REM
14150 REM
15000 REM MOVE SECTION OF SCREEN
15010 CLS
15020 SCREEN0,0
15030 INPUT"SIZE OF AREA (X,Y)";XX,YY
15040 PRINT
15050 PRINT"(1) ORDINARY",,"(2) INVERTED"
15060 PRINT"(3) SUPERIMPOSED"
15070 PRINT"(4) COMMON POINTS"
15080 CHOICE=VAL(INKEY$)
15090 IF CHOICE<1 OR CHOICE>4 THEN 15080
15100 SOUND 1,5
15110 SCREEN 1,COLOUR
15120 XOLD=X:YOLD=Y
15130 PUT(XOLD,YOLD)-(XOLD,YOLD),DUMMY,NOT
15140 PUT(XOLD,YOLD)-(XOLD,YOLD),DUMMY,NOT
15150 IF JOYSTK(0)>50 THEN XOLD=XOLD+1
15160 IF JOYSTK(0)<14 THEN XOLD=XOLD-1
15170 IF XOLD<0 THEN XOLD=0
15180 IF XOLD>255-XX THEN XOLD=255-XX
15190 IF JOYSTK(1)>50 THEN YOLD=YOLD+1
15200 IF JOYSTK(1)<14 THEN YOLD=YOLD-1
15210 IF YOLD<0 THEN YOLD=0
15220 IF YOLD>191-YY THEN YOLD=191-YY
15230 IF (PEEK(65280) AND 1)=1 THEN 15130
15240 SOUND 100,3
15250 XNEW=XOLD:YNEW=YOLD
15260 PUT(XNEW,YNEW)-(XNEW,YNEW),DUMMY,NOT
15270 PUT(XNEW,YNEW)-(XNEW,YNEW),DUMMY,NOT
15280 IF JOYSTK(0)>50 THEN XNEW=XNEW+1
15290 IF JOYSTK(0)<14 THEN XNEW=XNEW-1
15300 IF XNEW<0 THEN XNEW=0
15310 IF XNEW>255-XX THEN XNEW=255-XX
15320 IF JOYSTK(1)>50 THEN YNEW=YNEW+1
15330 IF JOYSTK(1)<14 THEN YNEW=YNEW-1
15340 IF YNEW<0 THEN YNEW=0
15350 IF YNEW>255-YY THEN YNEW=255-YY
15360 IF (PEEK(65280) AND 1)=1 THEN 15260
15370 SOUND 100,3
15380 GET(XOLD,YOLD)-(XOLD+XX,YOLD+YY),SHAPE,G
15390 ON CHOICE GOSUB 15420,15450,15480,15510
15400 RETURN
15410 REM
15420 PUT(XNEW,YNEW)-(XNEW+XX,YNEW+YY),SHAPE,PSET
15430 RETURN
15440 REM
15450 PUT(XNEW,YNEW)-(XNEW+XX,YNEW+YY),SHAPE,PRESET
15460 RETURN
15470 REM
15480 PUT(XNEW,YNEW)-(XNEW+XX,YNEW+YY),SHAPE,OR
15490 RETURN
15500 REM
15510 PUT(XNEW,YNEW)-(XNEW+XX,YNEW+YY),SHAPE,AND
15520 RETURN
15530 REM
15540 REM
16000 REM OUTPUT SCREEN TO PRINTER
16010 POKE&HFFD9,0
16020 PRINT#-2
16030 PRINT#-2,CHR$(8)
16040 IF MODE/2<>INT(MODE/2) THEN PMODE MODE+1
16050 SCREEN 1,0
16060 FOR YY=0 TO 189 STEP 7
16070 FOR XX=0 TO 255
16080 OO=PPOINT(XX,YY)+PPOINT(XX,YY+1)*2+PPOINT(XX,YY+2)*4+PPOINT(XX,YY+3)*8+PPO
INT(XX,YY+4)*16+PPOINT(XX,YY+5)*32+PPOINT(XX,YY+6)*64+128
16090 PRINT#-2,CHR$(OO);
16100 NEXT XX
16110 PRINT#-2
16120 NEXTYY
16130 YY=190
16140 FOR XX=0 TO 255
16150 OO=PPOINT(XX,YY)+PPOINT(XX,YY+1)*2+128
16160 NEXT XX
16170 PRINT#-2,CHR$(15)
16180 PMODE MODE:SCREEN 1,COLOUR
16190 POKE &HFFD8,0
16200 RETURN
```

```
240 PUT(X,Y)-(X,Y),DUMMY,NOT:IF KEY$="" THEN 230

330 IF KEY$="^" THEN KEY$="BU":GOSUB 7000:REM CONVERT CURSOR KEYS TO DRAW FORMAT
340 IF KEY$=CHR$(10) THEN KEY$="BD":GOSUB 7000
350 IF KEY$=CHR$(8) THEN KEY$="BL":GOSUB 7000
360 IF KEY$=CHR$(9) THEN KEY$="BR":GOSUB 7000

3020 IF KEY$=CHR$(12) THEN DRAW"RC"+STR$(BACK):FOR OO=0 TO 250:NEXT OO:DRAW"LC"+
STR$(FRGD):REM FLASH CURSOR
3030 IF KEY$="" OR KEY$=CHR$(12) THEN 3000

3050 GOSUB 3070

3070 IF KEY$="]" THEN DRAW"A0BR8A"+STR$(ANGLE)
3080 IF KEY$=CHR$(21) THEN DRAW "A0BL8A"+STR$(ANGLE)
3090 IF KEY$="_" THEN DRAW"A0BU8A"+STR$(ANGLE)
3100 IF KEY$="[" THEN DRAW"A0BD8A"+STR$(ANGLE)
3110 REM
```

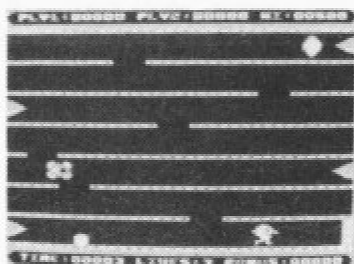
Listing 2: the changes necessary for Dragons without joysticks.

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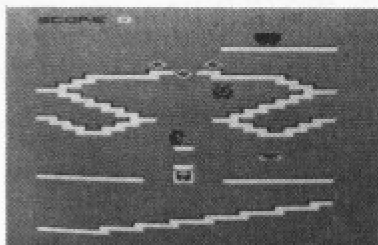
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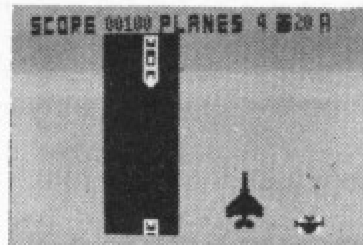
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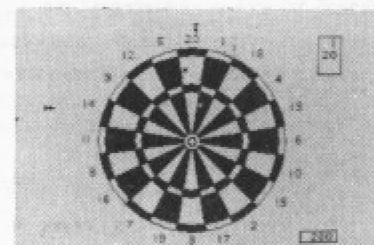
BORIS THE BOLD — Urgent telegram for Boris, Stop. Please come home, Stop. Beware of the patrollers, lasers and bombs, Stop. Please grab a few diamonds on your way, Stop. **£1.99**



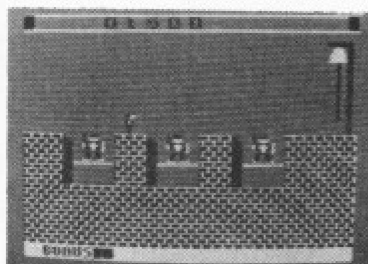
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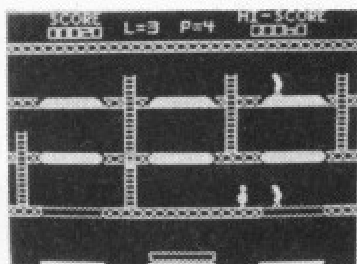
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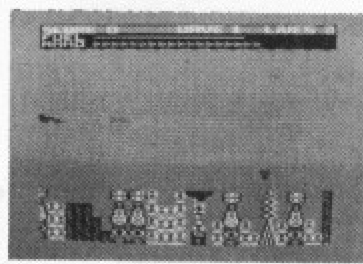
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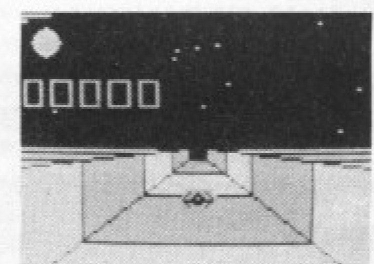
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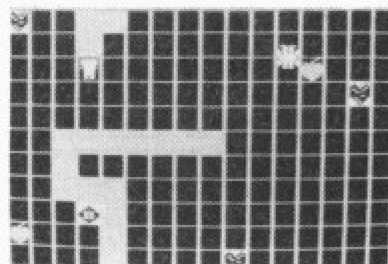
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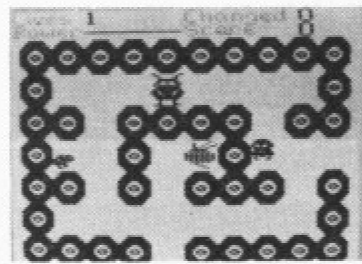
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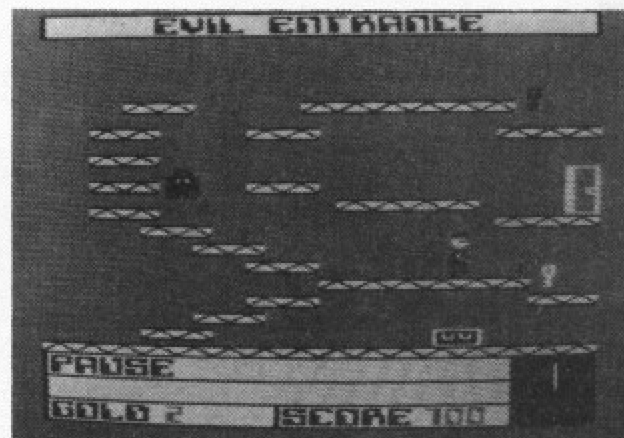
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Screen Edit

From Wayne Smithson in Leeds

THIS PROGRAM is a full screen editor to edit graphics characters and allows you to create graphics screens to be loaded in before your own program. The program is easy-to-use provided the instructions are read carefully. This way is much better than writing a program with endless data statements full of numbers to be POKEed or PRINTed on the screen.

You can create eight screens at once and store them; copy screens; save all eight or just the finished screen to tape; load them back in again to carry on editing; choose any character in any colour; draw and erase; move around all the screen quickly and if everything goes wrong you can clear the screen and start again.

Program notes

The following instructions are to help you use the program efficiently and may sound complicated at first but as you use the program they will become clearer.

Arrow keys — Move cursor around the screen at high speed!

Clear key — Clears the screen to the background colour chosen (default= black).

B — Background or border choice. Allows you to choose any colour background (including multi-coloured) or any character border (in any colour).

C — Character choose. Allows you to pick any character from a set by using left and right arrow keys to choose character. Press spacebar when you have selected the chosen character.

D — Draw character (chosen in "C") on screen when you move around the screen. This also allows you to rub out by using "G" (see G).

E — Erase. This doesn't actually erase but is used to get out of DRAW mode. This changes the cursor back into a "sprite". You will then be able to move around the screen without actually doing anything.

F — Finished editing. This will take you out of editing mode and you will be faced with another menu. Follow the menu's instructions carefully.

G — Get rid of character! (erase if you like). This is only effective in DRAW mode and erases characters as you move. Typing 'G' again will put you back in draw mode. Using "E", "D", "G" you can create pictures very quickly, draw broken lines and so on.

L — List out menu. There is a mini-menu that you can look at while editing that should jog your memory if you forget any commands.

M — Move screen. This allows you to shift the whole screen (except borders) to either the left or to the right. For example, if you drew a picture on the screen and it wasn't in the middle, you would use this to move it.

S — Screen change. This gives you a choice of two coloured screens. There is green (usual) or orange (screen 0,1).

T — Text on screen. This allows you to place text on the screen in inverse video or normal. Any text in inverse video must be placed inside ";" e.g.;HENRY WOZ 'ERE 1882; would be placed on the screen in inverse video.

Should anyone have any problems with the program, I would be glad to help, and also, I realise that there is a lot of keyboard bashing to be done before you can use it so I will gladly save the program for you for a small fee if you send an SAE, a cassette and £1 to the following address: Wayne J Smithson, 24 Coal-Hill Green, Bramley.

```
10 '***************************'
20 '** SCREDIT SCREEN EDITOR **'
30 '*** *** *** *** *** *** ***'
40 '**   *** WRITTEN BY: ***   **'
50 '**    WAYNE J. SMITHSON    **'
60 '***************************'
70 '** (C)1984 W.J. SMITHSON **'
80 '***************************'
90 '                          '
100 GOTO130
110 IF ED$="D" THENY=2
120 RETURN
130 PCLEAR8:CLEAR500,31999:BS=128:
ED$="E":CH=143:X=1024:SC=1:SOUND1,
1:POKE&H7FFE,&H04:POKE&H7FFF,&H00:
GOSUB660
140 '
150 CLS:CLS:'(JUST TO MAKE SURE)
160 '
170 CLS:PRINT@64,STRING$(32,42);"*
* 'SCREDIT' - SCREEN EDITOR. *****
****************************** WRI
TTEN BY WAYNE J. SMITHSON *";STRIN
G$(32,42):SCREEN0,1
180 FORN=1TO5:EXEC32000:NEXT:PRINT
@384,"*SCREEN EDITOR BY W.J. SMITH
SON*":SCREEN0,1:FORN=1TO3:EXEC3200
0:NEXT:FORN=1TO12:PRINT@480,"":EXE
C32033:NEXT:GOSUB770:GOTO500
190 EXEC32100:CLS:PRINT@64,"DO YOU
 WANT:-",,"(1) SCREEN 0,1",,"(2) S
CREEN 0,0",,"ENTER 1 OR 2-->";
200 '
210 ' SEE YOU JIMMY!
220 ' I GI YA WUN WI THE HEED!
230 '
240 Q$=INKEY$:IFQ$="1" THENEXEC321
50:SCREEN0,1:S=1:RETURN ELSE IFQ$=
"2" THENEXEC32150:SCREEN0,0:S=0:RE
TURN ELSE240          250 EXEC32100
260 CLS:PRINT@64,"DO YOU WANT:-",,
"(1) BACKGROUND",,"(2) BORDER",,"(
3) GO BACK TO EDIT MODE",,,"OPTION
 --->";
```

Continued on page 31

. . . MST . . . MST . . . MST . . .

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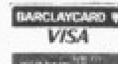
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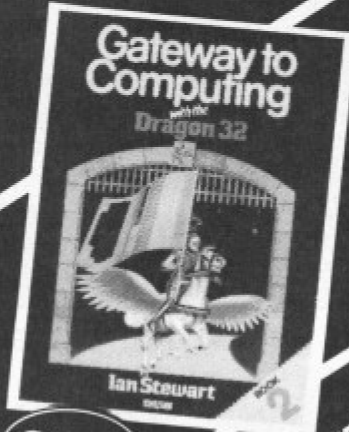


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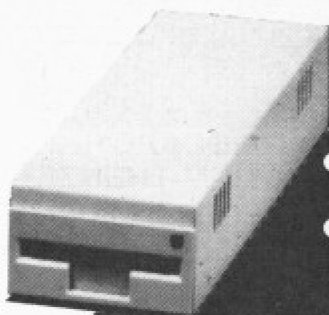
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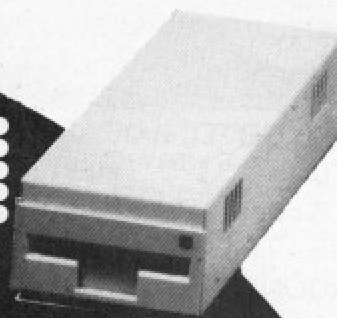
```
270 Q$=INKEY$:IFQ$<"1" OR Q$>"3" T
HEN270 ELSEPRINTQ$:IFQ$="3" THENEX
EC32150:GOTO510
280 IFQ$<>"1" THEN330
290 CLS:PRINT"background set":PRIN
T"PRESS THE @ KEY WHEN YOU SEE THE
BACKGROUND THAT YOU WANT          N.
B. destroys present screen":GOSUB7
50:FORB=0TO8:N=0:CLS(B):PRINT@480,
C$(B);
300 N=N+1:Q$=INKEY$:IFQ$="@" THEN3
20 ELSE IFN<100 THEN300 ELSE NEXTB
:B=9:PRINT@0,"";:FORN=143TO255STEP
16:PRINTSTRING$(32,N);:NEXT:FORN=2
39TO143STEP-16:PRINTSTRING$(32,N);
:NEXT:PRINT@480,C$(B);:N=0
310 Q$=INKEY$:IFQ$="@" THEN320 ELS
EN=N+1:IFN<100 THEN310 ELSE260
320 W1=B:CLS:Y=0:PRINT"YOU CHOSE "
C$(W1):FORN=0TO999:NEXT:IFW1<9 THE
NCLS(W1):BS=PEEK(1111):GOTO510 ELS
EPRINT@0,"";:FORN=143TO255STEP16:P
RINTSTRING$(32,N);:NEXT:FORN=239TO
143STEP-16:PRINTSTRING$(32,N);:NEX
T:BS=PEEK(1111):GOTO510
330 CLS:FORN=129TO143:PRINTSTRING$
(32,N);:NEXT:FORNN=0TO6:FORN=1024T
O1535:POKEN,PEEK(N)+16
340 Q$=INKEY$:IFQ$="@" THEN360 ELS
ENEXTN,NN:FORN=1024TO1535:POKEN,PE
EK(N)-112
350 Q$=INKEY$:IFQ$="@" THEN360 ELS
ENEXTN:GOTO260
360 Y=0:BO=PEEK(N):SCREEN0,S:EXEC3
2150:FORN=1024TO1055:POKEN,BO:POKE
N+480,BO:NEXT:FORN=0TO15:FORN=1055
TO1513STEP32:POKEN,BO:POKEN+1,BO:N
EXT:GOTO510
370 EXEC32100
380 CLS:PRINT@64,"ENTER YOUR LINE
OF TEXT PUTTING ';' ROUND ANY BITS
 THAT WANT TO BE inverse video":LI
NEINPUT"TEXT:-";T$
390 PRINT"WHEN YOU GET TO WHERE YO
U WANT  TO PUT THE TEXT THEN PRESS
 'P'  FOR PUT, IF YOU WANT TO RUB
IT  OUT AGAIN, PRESS 'R' FOR ERASE
.":GOSUB750:SCREEN0,S:EXEC32150:GO
TO510
400 IFT$=""THEN 510 ELSEEXEC32100
410 CLS:LL=LEN(T$):L=LL:FORN=1TOLL
:IFMID$(T$,N,1)=";" THENL=L-1:NEXT
 ELSENEXT
420 IFX+L>1535 THENPRINT"NOT ENUFF
 ROOM ON SCREEN FROM    HERE.....TR
Y AGAIN":GOSUB750:SCREEN0,S:EXEC32
150:GOTO510
430 T1$="":EXEC32150:FORN=X+1 TO X
+L:T1$=T1$+CHR$(PEEK(N)):NEXT:LL=L
EN(T$):FORN=1TOLL:IF MID$(T$,N,1)=
";" THENIFZ=0 THENZ=1:NEXT ELSEZ=0
:NEXT
440 IFZ=1 THENZZ=64 ELSE IFZ=0 THE
NZZ=0
450 IF MID$(T$,N,1)<"@" AND Z=1 TH
ENZZ=0:GOTO480
460 IFMID$(T$,N,1)<"A" THENZZ=-64
470 IF N>LL THENQ=0:GOTO510
480 Q=Q+1:POKEX+Q,ASC(MID$(T$,N,1)
)-ZZ:NEXTN:Q=0:GOTO510
490 IFT1$=""THEN510 ELSE FORN=1TO
LEN(T1$):POKEX+N,ASC(MID$(T1$,N,1)
):NEXT:GOTO510
500 CLS:PRINT"YOU ARE NOW IN EDITI
NG MODE.....":EXEC32000:EXEC32150
510 GOSUB110:Q$=INKEY$:IFQ$=""THEN
580ELSEIFY=2 THENPOKEX,CH ELSE POK
EX,P
520 IF Q$=CHR$(12) THEN IF W1<9 TH
ENCLS(W1):BS=PEEK(1111) ELSEB=9:GO
TO320:BS=PEEK(1111)
530 IFQ$="B"THEN250 ELSEIFQ$="L" G
OSUB770 ELSEIFQ$="T" THEN370 ELSEI
FQ$="P" THEN400 ELSEIFQ$="R" THEN4
90 ELSEIFQ$="S" GOSUB190
540 IF Q$="F" THENEXEC32100:GOTO81
0 ELSEIF Q$=" " GOSUB1030
550 IF Q$="D" THEN ED$="D":GOTO510
 ELSE IF Q$="E" THEN ED$="E":GOTO5
10
560 IF Q$="G" THEN IF CH=BS THEN C
H=TE ELSE TE=CH:CH=BS
570 IF Q$="C" GOSUB1050 ELSEIFQ$="
M" GOSUB1100
580 GOSUB110:IFY=2 THENP=PEEK(X):P
OKEX,CH:Y=0 ELSE IF Y=1 THENPOKEX,
P:Y=0
590 IF Y=0 THENP=PEEK(X):POKEX,RND
(2)+149:Y=1
600 IFPEEK(344)<>223 THEN620 ELSE
IF Y=2 THENPOKEX,CH:Y=2 ELSE POKEX
,P:Y=0
610 IFX<1535 THENX=X+1:GOTO580
620 IFPEEK(343)=223 THENPOKEX,P:IF
X>1024 THENX=X-1:Y=0:GOTO580
630 IFPEEK(341)=223 THENPOKEX,P:IF
X>1055 THENX=X-32:Y=0:GOTO580
640 IFPEEK(342)=223 THENPOKEX,P:IF
X<1504 THENX=X+32:Y=0:GOTO580
650 GOTO510
660 FORN=32000TO32069:READA$:POKEN
,VAL("&H"+A$):NEXT:FORN=32100TO321
16:READA$:POKEN,VAL("&H"+A$):NEXT:
FORN=32150TO32166:READA$:POKEN,VAL
("&H"+A$):NEXT
670 FORN=0TO9:READC$(N):NEXT:RETUR
N
```

Continued on page 33

```
680 '
690 ' ALTER THIS DATA FOR A
700 ' DIFFERENT PROGRAM!!!!
710 '
720 DATA 8E,4,0,A6,84,80,40,A7,80,
8C,6,0,26,F5,8D,11,8E,4,0,A6,84,8B
,40,A7,80,8C,6,0,26,F5,8D,1,39,86,
FF,B7,FF,23,86,C8,B7,FF,20,8E,1,0,
30,1F,26,FC,7F,FF,20,8D,9,73,FF,20
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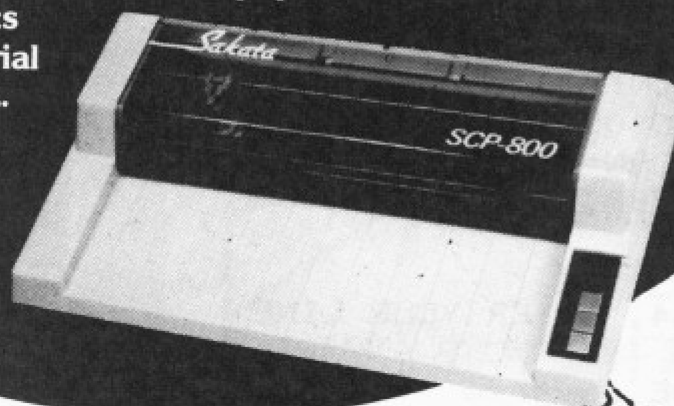
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```
,8D,4,4A,26,E9,39,1F,89,5A,26,FD,3
9
730 DATA 8E,4,0,10,BE,7F,FE,A6,80,
A7,A0,8C,6,0,26,F7,39,8E,4,0,10,BE
,7F,FE,A6,A0,A7,80,8C,6,0,26,F7,39
740 DATA BLACK,GREEN,YELLOW,BLUE,R
ED,BUFF,CYAN,MAGENTA,ORANGE,MULTI-
COLOURED
750 Q$=INKEY$:IFQ$<>" " THENPRINT@
486,"SPACEBAR TO CONTINUE";:SCREEN
0,1:Q$=INKEY$:IFQ$<>" " THENPRINT@
486,"spacebar to continue";:SCREEN
0,1:GOTO750
760 RETURN
770 EXEC32100:CLS:PRINT"*SCREEN ED
ITOR BY W.J. SMITHSON*":PRINT@71,"
keyboard commands":POKE1103,32:FOR
N=1024TO1055:POKEN,PEEK(N)-64:NEXT
780 PRINT"bORDER-SET BORDER OR BAC
KGROUND tEXT-PLACE TEXT ON SCREEN
      cHARACTER-CHOOSE CHR$","gETR
ID-ON/OFF TO ERASE CHR$","sCREEN-C
HANGE SCREEN TO 0,1/0,0 fINISH-FIN
ISHED EDITING?          lIST-LOOK AT
 THIS LIST"
790 PRINT"mOVE SCREEN-SCREEN LEFT
OR RIGHTe/d-DRAW OFF/DRAW ON","cle
ar-CLEAR SCREEN","space-CHANGE CHR
$ COLOUR"
800 PRINT"arrow keys-MOVE CURSOR":
GOSUB750:EXEC32150:SCREEN0,S:RETUR
N
810 CLS:PRINT"*SCREEN EDITOR BY W.
J. SMITHSON*",,">1< GO BACK TO EDI
T MODE",">2< SAVE CURRENT SCREEN",
">3< SAVE ALL SCREENS (1-8)",">4<
LOAD SCREEN(S) FROM TAPE",">5< EDI
T DIFFERENT SCREEN",">6< COPY SCRE
ENS":SCREEN0,1:EXEC32000
820 PRINT@320,"INPUT CHOICE-->";
830 Q=VAL(INKEY$):PRINTQ:ON Q GOTO
 500,850,850,900,950,1000
840 GOTO820
850 INPUT"WHAT FILE-NAME PLEASE";F
$
860 IF LEN(F$)>8 THENPRINT"NAME TO
O LONG, 8 LETTERS MAX.":GOTO850 EL
SE PRINT"PRESS spacebar TO SAVE"
870 IF INKEY$<>" " THEN870 ELSE IF
 Q=2 THEN EXEC32150:POKE1536,PEEK(
1024)
880 IF Q=2 THEN CSAVEM F$,1024,153
6,512:SOUND1,10:GOTO810
890 CSAVEM F$,1536,13824,12288:SOU
ND1,10:GOTO810
900 INPUT"WHAT FILE NAME (TYPE ent
er TO   LOAD ANY NAME";F$
910 PRINT"PRESS spacebar TO LOAD"
920 IF INKEY$<>" " THEN920
930 IF F$="" THEN CLOADM ELSE CLOA
DM F$
940 POKE&H7FFE,6:POKE&H7FFF,0:IF P
EEK(&H9D)*256+PEEK(&H9E)=12288 THE
NCLS:PRINT"ALL 8 SCREENS LOADED IN
":GOSUB750:GOTO810 ELSE POKE1024,P
EEK(1536):EXEC32100:CLS:PRINT"SCRE
EN NUMBER 1 LOADED IN":GOSUB750:GO
TO810
950 CLS:PRINT"YOU ARE ON SCREEN NU
MBER";(PEEK(&H7FFE)*256+PEEK(&H7FF
F))/1536:PRINT"WHICH NUMBER DO YOU
 WANT (1-8)";
960 Q=VAL(INKEY$):IFQ<1 OR Q>8 THE
N960 ELSEPRINTQ
970 POKE&H7FFE,INT((Q*1536)/256):P
OKE&H7FFF,0
980 PRINT"PRESS spacebar TO SEE SC
REEN";Q
990 IF INKEY$<>" " THEN990 ELSE EX
EC32150:FORN=0TO999:NEXT:GOTO810
1000 PRINT"COPY WHICH SCREEN-->";
1010 Q=VAL(INKEY$):IF Q<1 OR Q>8 T
HEN1010 ELSEPRINTQ:PRINT"TO WHICH
SCREEN-->";
1020 Q1=VAL(INKEY$):IF Q1<1 OR Q1>
8 THEN1020 ELSEPRINTQ1:PCOPY Q TO
Q1:PRINT"'TIS DONE 'O GREAT ONE!":
GOSUB750:GOTO810
1030 CH=CH+16:IF CH>255 THEN CH=CH
-128                     1040 RETURN
1050 EXEC32100:CLS3:NN=128:FORN=10
24TO1055STEP2:POKEN,NN:NN=NN+1:NEX
T:AR=1056:PRINT@224,"PRESS 'C' TO
CANCEL THIS MODE."
1060 POKE AR,94:Q$=INKEY$:IF Q$=CH
R$(8) THEN IF AR>1056 THEN POKE AR
,175:AR=AR-2:GOTO1060
1070 IF Q$=CHR$(9) THEN IF AR<1086
 THEN POKE AR,175:AR=AR+2:GOTO1060
1080 IF Q$="C" THEN EXEC32150:RETU
RN ELSE IF Q$<>" " THEN1060
1090 CH=PEEK(AR-32):PRINT"REMEMBER
 TO PRESS THE SPACEBAR  TO CHANGE
COLOUR,IT IS NOW GREEN":GOSUB750:E
XEC32150:RETURN
1100 EXEC32100
1110 CLS:INPUT"PRESS 'C' TO CANCEL
 THIS MODE    MOVE LEFT OR RIGHT";L
$
1120 IF LEFT$(L$,1)="L" THEN1140 E
LSE IF LEFT$(L$,1)="C" THENEXEC321
50:RETURN ELSE IF LEFT$(L$,1)<>"R"
 THENSOUND1,1:GOTO1110
1130 EXEC32150:FORN=1TO15:FORZ=105
4TO1025STEP-1:T3=PEEK(Z+N*32):POKE
Z+N*32,PEEK((Z+N*32)-1):NEXTZ:POKE
1025+N*32,T3:NEXTN:RETURN
1140 EXEC32150:FORN=1TO15:FORZ=102
5TO1054:T3=PEEK(Z+N*32):POKEZ+N*32
,PEEK((Z+N*32)+1):NEXTZ:POKE1054+N
*32,T3:NEXTN:RETURN
1150 '
1160 ' TYPE 'GOTO 500' IF YOU
1170 ' GET AN I/O ERROR OR
1180 ' ACCIDENTALY PRESS BREAK.
1190 '
```

Swapover

From Keith David in West Sussex

SWAPOVER is a board puzzle, the object of which is to shuffle pieces around the board until their positions are reversed. Anyone can do this, but to do it in less than 50 moves requires considerable skill. The program counts your moves, and displays an appropriate message at the end, depending on how close your score is to the perfect possible score of 46 moves.

You may slide a piece into an empty space, or jump over another piece of either colour into an empty space. To move a piece, just type in its co-ordinates (letter first), and the piece will move automatically.

Program notes

Lines	
50-330	Draw the board. Although the board is mathematically symmetrical, the resolution obtained in PMODE 3 gives a slightly three-dimensional effect when the surround is drawn in line 70.
370-620	Move pieces, search for a win, and count score. In order to recognise a win, it is not necessary to examine every piece. If the first nine are correct, then the other eight must be. Lines 390-410 examine the first six using a FOR NEXT loop, and if these are correct, then line 420 examines the next three.
630-730	Display score, together with an appropriate message.
750-770	Instructions.

A cassette demonstrating the perfect 46 move solution can be obtained by sending £1 with a stamped self-addressed envelope to: Keith David, 51 Mill Road, Three Bridges, Crawley, W Sussex.

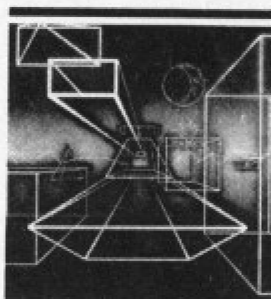
```
10 REM "SWAPOVER"
20 CLS
30 GOSUB 750
40 DIMR(0,11),B(0,11),Y(0,11)
50 REM DRAW BOARD
60 PMODE3:PCLS:SCREEN1,0
70 DRAW"BM58,26;R88D52R52D88L88U52
L52U88BL3BU3R94D52R52D94L94U52L52U
94"
80 PAINT(128,96),2,4
90 FOR X=63 TO 115 STEP26:FOR Y=31
 TO 83 STEP26
100 LINE(X,Y)-(X+26,Y+26),PSET,B
110 NEXT Y,X
120 FOR X=115 TO 167 STEP26:FOR Y=
83 TO 135 STEP26
130 LINE(X,Y)-(X+26,Y+26),PSET,B
140 NEXT Y,X
150 FOR X=76 TO 128 STEP26:FOR Y=4
4 TO 96 STEP26
160 CIRCLE(X,Y),8,4:PAINT(X,Y),4,4
170 NEXT Y,X
180 FOR X=128 TO 180 STEP26:FOR Y=
96 TO 148 STEP26
190 CIRCLE(X,Y),8,3:PAINT(X,Y),3,3
200 NEXT Y,X 210 PAINT(128,96),2,4
220 A$="U10R6D10U5L6"
230 B$="U10R4D5L4R6D5L6"
240 C$="BU2U6E2R4BD10L4H2"
250 D$="U10R4F2D6G2L4"
260 E$="NR6U5NR4U5R6"
270 F$="BR3U10"
280 G$="NR6U5R6U5L6"
290 H$="R6U5NL4U5L6"
300 I$="NU10R4NU2ND2R2"
310 J$="R6U5L6U5R6"
320 DRAW"BM73,18;XA$;BM99,18;XB$;B
M125,18;XC$;BM125,185;XC$;BM151,18
5;XD$;BM177,185;XE$;"
330 DRAW"BM42,49;XF$;BM42,75;XG$;B
M42,101;XH$;BM206,101;XH$;BM206,12
7;XI$;BM206,153;XJ$;"
340 GET(66,34)-(86,54),R,G
350 GET(170,138)-(190,158),B,G
360 GET(118,86)-(138,106),Y,G
370 REM MOVE PIECES
380 M=0
390 FOR X=76 TO 128 STEP26:FOR Y=4
4 TO 70 STEP26
400 IF PPOINT(X,Y)=3 THEN 410 ELSE
 430
410 NEXT Y,X
420 IF PPOINT(76,96)=3 AND PPOINT(
102,96)=3 AND PPOINT(126,96)=2 THE
N 640
430 L$=INKEY$:IF L$<"A" OR L$>"G"T
HEN 430
440 X=(ASC(L$)-65)*26+76
450 N$=INKEY$:IF N$<"1" OR N$>"5"
THEN 450
460 Y=26*VAL(N$)+18
470 IF PPOINT(X,Y)=2 THEN SOUND 5,
5:GOTO 430
480 FOR S=X-52 TO X+52 STEP26
490 IF PPOINT(S,Y)<>2 THEN 500 ELS
E X1=S:Y1=Y:GOTO 560
500 NEXT S
510 FOR T=Y-52 TO Y+52 STEP26
520 IF T<44  THEN 540
530 IF PPOINT(X,T)<>2 THEN 540 ELS
E X1=X:Y1=T:GOTO 560
540 NEXT T    550 SOUND5.5:GOTO 430
560 IF PPOINT(X,Y)=4 THEN 580
570 IF PPOINT(X,Y)=3 THEN 600
580 PUT(X-10,Y-10)-(X+10,Y+10),Y,P
SET
590 PUT(X1-10,Y1-10)-(X1+10,Y1+10)
,R,PSET:GOTO 620
600 PUT(X-10,Y-10)-(X+10,Y+10),Y,P
SET
610 PUT(X1-10,Y1-10)-(X1+10,Y1+10)
,B,PSET
620 M=M+1:GOTO 390
630 REM SCORE
640 CLS:PRINT@228,"STAND BY FOR YO
UR SCORE!";
650 N=M-46
660 FOR I=1 TO 1500:NEXT I
670 FOR C=1 TO 8:CLSC:FOR I=1 TO 1
50:NEXT I,C
680 IF N=0 THEN 700 ELSE 710
690 REM PRINT RELEVANT MESSAGE
700 PRINT@136,"YOU DID IT IN ";M;:
PRINT@259,"THAT MEANS YOU'RE PERFE
CT!";:PRINT@418,"PRESS ANY KEY FOR
 ANOTHER GO";:GOTO 740
710 IF N<10 THEN 720 ELSE 730
720 PRINT@108,"NOT BAD!";:PRINT@20
0,"YOU DID IT IN ";M;:PRINT@288,"T
HAT MEANS YOU'RE ONLY ";N;" MOVESF
ROM PERFECTION";:PRINT@418,"PRESS
ANY KEY FOR ANOTHER GO";:GOTO 740
730 PRINT@136,"YOU DID IT IN ";M;:
PRINT@292,"THAT MEANS YOU'RE ";N;"
 MOVES FROM PERFECTION";:PRINT@418
,"PRESS ANY KEY FOR ANOTHER GO";
740 A$=INKEY$:IF A$="" THEN 740 EL
SE 60
750 PRINT@42,"'SWAPOVER'";:PRINT@7
4,"**********";:PRINT@128,"INSTRUC
TIONS:-   REVERSE THE    POSITIONS
 OF THE RED AND BLUE    PIECES BY J
UMPING OR SLIDING     INTO THE VACA
NT SPACE. IT IS     POSSIBLE TO DO
THIS IN 46 MOVES."
760 PRINT:PRINT "TYPE CO-ORDINATES
 (LETTER FIRST)TO MOVE.":PRINT@453
,"PRESS ANY KEY TO PLAY"
770 A$=INKEY$:IF A$="" THEN 770 EL
SE RETURN
```

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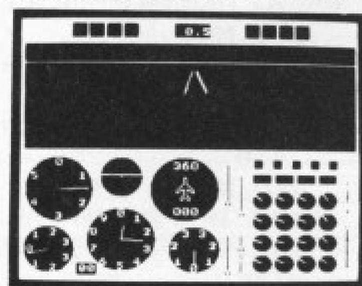
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Dragon

conv

John Buckley gives the tokens and listings necessar

THE TANDY Color Computer and the Dragon 32 are both based on the 6809E chip. They also share Microsoft Basic. When typing Basic programs into either machine there is no need to change anything for even their screen formats are identical. One might therefore think that a program which runs on one machine could be saved to tape and then run on the other.

However, this is not so. When presented with a tape recorded by one machine when the micro you own is the other the tape will load OK but as soon as you type RUN the only thing you can get out of your trusty micro is a syntax error (and there is nothing more frustrating than that).

The problem is that the Dragon and CoCo use different tokens to represent Basic commands. "What is a token?" you ask. When you type in a Basic command it is recognised by all those good little bits in ROM and, rather than storing it as a string of letters in ASCII, it is stored using only one or two bytes of memory. These bytes are the tokens which your micro recognises as Basic commands when you RUN the program. So when you CLOAD a program into a CoCo that was CSAVEd from a Dragon (or vice versa) many of the tokens will be "misinterpreted".

You can explore the tokens in your micro by typing in listing 1. Program lines 30 to 100 POKE the values 128 to 255 into program line 10, ten values at a time. Line 70 PRINTs the values which were POKEd and line 90 LISTs program line 10 with the values now represented by the corresponding Basic command. Typing GOTO 100 will cycle through the next ten values. The second half of the program does the same thing for the two byte tokens.

A listing of the tokens for both the Dragon and Coco, together with their associated commands, is given in table 1. The table is in two parts. The left side lists the Basic commands in alphabetic order with the corresponding tokens for the CoCo and Dragon. The right half of the table lists the tokens in numeric order with the corresponding commands.

Several alternatives

Once you have the tokens there are several alternatives regarding what you can do with them — you can list them in DATA statements, READ them into arrays and then use the arrays as look-up tables. This would occupy a fair amount of storage space (about 3K) which, if you are only translating short programs, may not make much difference.

If you are trying to translate a program which takes up most of your available memory then any trick which saves a few bytes is to your advantage. I chose the memory saving method.

I set up a translation program which allowed me to input the look-up tables, print them out (table 1), save them to tape and read them from tape (see listing 2).

```
10 DATA 123456789012345678901234567890
20 ST=PEEK(25)*256+PEEK(26)
30 FORI=128TO255STEP10
40 FORJ=0TO9:IFI+J>255THEN60
50 POKEST+6+2*J,I+J:POKEST+7+2*J,44:NEXTJ
60 CLS
70 FORJ=0TO9:PRINTI+J;:NEXTJ
90 LIST10
100 NEXTI
110 FORI=128TO255STEP10
120 FORJ=0TO9:IFI+J>255THEN140
130 POKEST+6+3*J,255:POKEST+7+3*J,I+J:
    POKEST+8+3*J,44:NEXTJ
140 CLS
150 FORJ=0TO9:PRINTI+J;:NEXTJ
160 LIST10
190 '***********************
200 '***    CLOAD"TOKEN    ***
210 '************************
```

Listing 1

The program is fairly short and user friendly. The remarks will help you to understand the various aspects of the program. With this program I saved my look-up tables to tape for future use.

One word of caution, the program as it stands is for Extended Basic and Disk Basic. Not having access to a Dragon disk I was unable to determine the tokens for the Dragon Disk Basic commands. For this reason you will find "0" in the token list for the Dragon or ?? in the keyword list of table 1. If you have a Dragon Disk system you can fill in the empty spots using listing 2.

Once you have entered listing 2, type RUN and select option "1" from the menu. You will receive the prompt "TOKEN = nnn," "ENTER DRAGON KEYWORD." Use the right half of table 1 to enter the correct command which corresponds to the token displayed. When you have entered all the commands the program will return to the menu. You can either print the table to the screen or printer or you can save it to tape.

Having saved the look-up tables my next step was to get them in a more useable and condensed form. Program listing 3 did this for me. It organises the one byte tokens into the arrays from subscript 1 through 78 and two byte tokens in arrays from subscript 79 to 112. It also reduced the token look-up table to eliminate the disk tokens. Of course, if you have the missing disk tokens you will want to save a complete set of tokens. To do this make the following changes in listing 3:

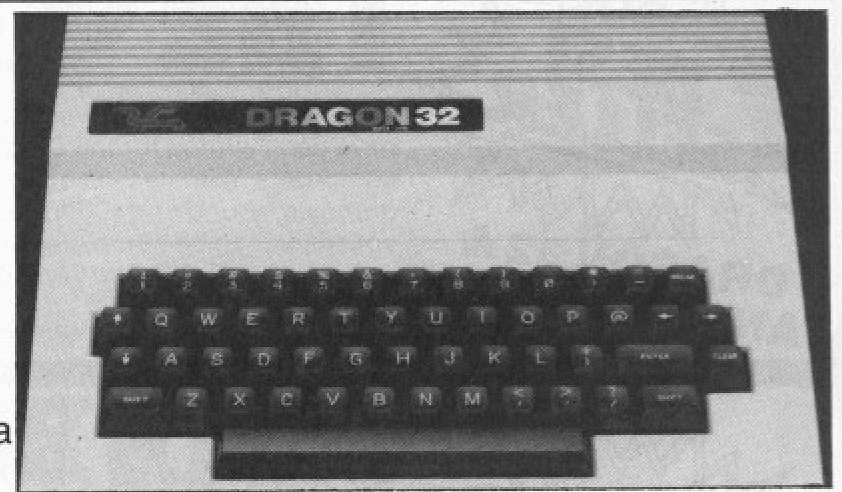
```
40 DIMTC(136),TD(136),CT(136),
   DT(136)
140 FORI=128TO224
190 FORI=255128TO255166
280 FORI=1TO136:...
```

The data saved by listing 3 will be used to translate Dragon to CoCo programs or vice versa. Program listing 4 does this. It reads the look-up tables into arrays TC(112) and TD(112) (lines 60070 through 60110), sets the end point for conversion to the beginning of the conversion program DRTOCC (line 60130), and merges the program to be converted with DRTOCC (line 60140) using a program we will discuss shortly. Line 60150 through 60180 keep us informed of the programs progress.

The actual conversion takes place in the subroutines starting on lines 60200 (two byte tokens) and 60220 (one byte tokens). Lines 60260 through 60340 step through

n /Tandy
v erter

sary to convert Tandy programs to the Dragon and vice versa



the program to be converted one byte at a time until it finds a token. It jumps to the conversion subroutines (line 60310 or 60320) to get the corresponding token and then POKEs it back into the program being converted (line 60330).

If you are using a disk-based sytem you will have to make the following changes to listing 4:

60030 DIMTC(136),TD(136)
60090 FORI=1TO136:...
60200 FORK=98TO136:GOTO60210
60220 FORK=1TO97

Listing 4 is set up to convert a Dragon program to run on the CoCo. If you have a Dragon and want to convert CoCo programs change program line 60230 to:

60230 IF TC(K)=TK THEN TK=TD(K): RETURN

Now that we have all the basics we need to put them together and make it work. One additional tool is needed: a merge program. Listing 5 does this for us. It is a machine language program which allows you to load the conversion program into the back of the program to be converted by making your micro think it doesn't have a program in memory.

Programming steps

Here are the steps to convert your program. CLOAD listing 5 and type RUN. You will receive the prompt line 40. Make sure none of the program lines in the program to be converted exceed 60000. If they do use RENUM to correct the situation. CLOAD the program to be converted and then enter EXEC32749. If you do a list at this stage all you will get from your friendly green eye will be OK. Don't despair, your program has not been lost, only masked by the program pointers.

CLOAD"DRTOCC" and type RUN. The conversion program now takes over and displays the start and end address of the program being converted as well as the current address being converted. Insure you have the look-up table CSAVEd on tape from listing 3 since the conversion program will start looking for it in line 60070. If a problem does arise the program will stop and give you an error message. When the conversion has been completed the conversion program will delete itself and give you a prompt to CSAVE the converted program.

If you don't want to go through all this work and aren't worried about memory space then program listing 6 is for you. It is self explanatory. Eliminating all the re-

Listing 2

```
10 '************************
20 '***   CLOAD"TRANS"   ***
30 '************************
40 CLEAR5000
50 DIM KW$(136),TD(136),TC(136)
60 GOTO1200
70 'input keywords to match tokens displayed
80 FORI=ST TO FI:CLS:PRINT@0,"TOKEN =";I
90 PRINT@64:PRINT@32,"ENTER DRAGON KEYWORD"
100 INPUTKW$
110 FORJ=0TO136:IFKW$=KW$(J)THENTD(J)=I:GOTO120:ELSENEXTJ:PRINT@480,"no match. r
eenter keyword";:SOUND200,1:GOTO90
120 PRINT@480,STRING$(26,32);
130 PRINT@64:PRINT@32,"ENTER COCO KEYWORD"
140 INPUTKW$
150 FORK=0TO136:IFKW$=KW$(K) THENTC(K)=I:GOTO160:ELSENEXTK:PRINT@480,"no match.
reenter keyword";:SOUND200,1:GOTO130
160 NEXTI
170 'match token to keyword for printout
180 KC$="":KD$=""
190 FORJ=0TO136
200 IFTC(J)=I THENKC$=KW$(J)
210 IFTD(J)=I THENKD$=KW$(J)
220 NEXTJ
230 IFKC$="" THENKC$="??"
240 IFKD$="" THENKD$="??"
250 RETURN
300 'enter keywords given tokens
310 FORI=0TO136:READKW$(I):NEXTI
320 ST=128:FI=224
330 GOSUB80'input data
340 ST=255128:FI=255166
350 GOSUB80'input data
360 RETURN
400 'print headings and tables
410 CLS:PRINT"INSURE PRINTER IS ON","PRESS ANY KEY TO CONTINUE"
420 A$=INKEY$:IFA$=""THEN420
430 CLS:PRINT@265,"P R I N T I N G"
440 A$="########"
450 PRINT#-2,STRING$(72,"-")
460 PRINT#-2,TAB(13)"!";TAB(20)"T O K E N";TAB(35)"!!";TAB(50)"!";TAB(55)"C O M
M A N D"
470 PRINT#-2,TAB(13)"!";STRING$(21,"-");"!!";TAB(50)"!";STRING$(21,"-")
480 PRINT#-2,"     COMMAND !   COCO   !  DRAGON  !!      TOKEN  !   COCO   !  DR
AGON
490 PRINT#-2,STRING$(13,"-");"!";STRING$(10,"-");"!";STRING$(10,"-");"!!";STRING
$(13,"-");"!";STRING$(10,"-");"!";STRING$(10,"-")
500 FORI=128TO224:GOSUB170:K=I-127:GOSUB530:NEXTI
510 FORI=255128TO255166:GOSUB170:K=I-255030:GOSUB530:NEXTI
520 RETURN
530 PRINT#-2,TAB(5)KW$(K);TAB(13)"!";:PRINT#-2,USINGA$;TC(K);:PRINT#-2,TAB(24)"!
";:PRINT#-2,USINGA$;TD(K);:PRINT#-2,TAB(35)"!!";TAB(40);:PRINT#-2,USINGA$;I;:PRI
NT#-2,TAB(50)"!  ";KC$;TAB(61)"!  ";KD$
540 RETURN  600 'output to tape    610 CLS
620 PRINT@384,"POSITION TAPE - PRESS play  AND  record":PRINT"PRESS enter TO CON
TINUE"
630 A$=INKEY$:IFA$<>CHR$(13)THEN630
640 CLS:PRINT"SAVING TO TAPE AS CSAVE'CONVRT'"
650 OPEN"O",-1,"CONVRT"
660 FORI=0TO136:PRINT#-1,KW$(I);TC(I);TD(I):NEXTI
670 CLOSE-1
680 RETURN
690 'input from tape
700 CLS:PRINT@384,"POSITION TAPE - PRESS play","PRESS enter TO CONTINUE"
710 A$=INKEY$:IFA$<>CHR$(13)THEN710
720 CLS:PRINT"SEARCHING FOR convrt"
730 OPEN"I",-1,"CONVRT"
740 CLS:PRINT"FOUND convrt"
750 FORI=0TO136:IFEOF(-1)THEN770
760 INPUT#-1,KW$(I),TC(I),TD(I):NEXTI
770 CLOSE-1
780 RETURN
800 'Print table to screen
810 CLS:PRINT"KEYWORD   COCO TKN  DRAGON TKN"
820 A$="#########"
830 FORI=1TO136STEP12
840 CLS:PRINT"KEYWORD   COCO TKN  DRAGON TKN"
850 PRINT@64,;
860 FORJ=0TO11:K=I+J:IFK>136THEN890
870 PRINTKW$(K);TAB(10);:PRINTUSINGA$;TC(K);TD(K)
880 NEXTJ
890 PRINT:PRINT"PRESS ANY KEY TO CONTINUE";
```

Continued on page 41

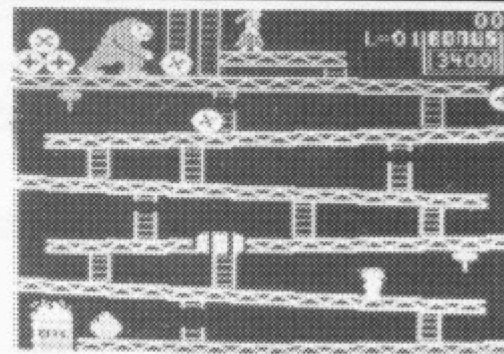
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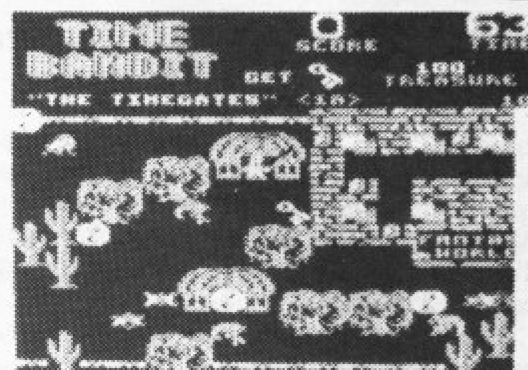
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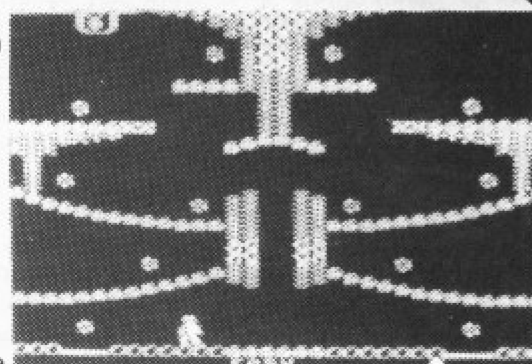
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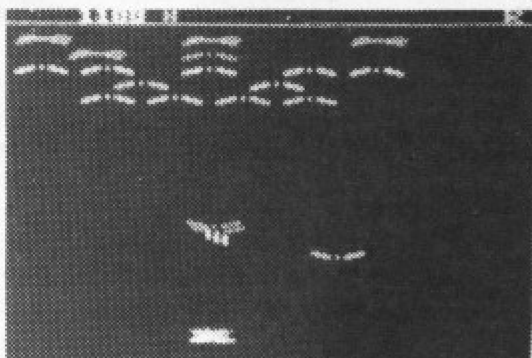
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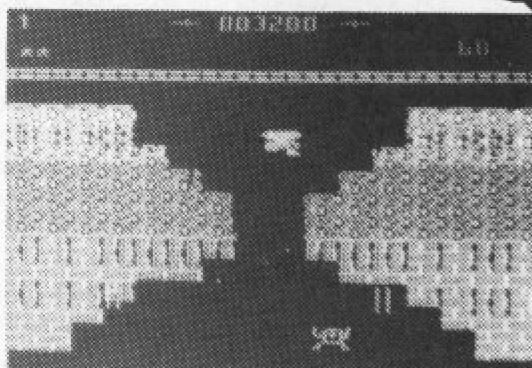
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marks will save some memory. You will still have to load the merge program and follow the same steps outlined above but you will be saved typing in several other programs.

Future use

Even if you don't type in listings 1 through 4 you should look them over since they do contain some interesting aspects which you may use in the future. Remember to change line 60350 to:

60350 IF TC(K)=TK THEN TK=TD(K): RETURN

if you want to use listing 6 on a Dragon.

If you have problems with the listings, write to me at 28 Broom Park, Teddington, TW11 9RS. Include a SAE and I will respond by return mail. If you want a tape copy of all the programs send £5.00 in cheque or money order made payable to J. Nichols. Please specify if you have a Dragon or CoCo. ■

Listing 2 continued

```
900 B$=INKEY$:IFB$=""THEN900
910 NEXTI
920 RETURN
930 DATA !!,ABS,AND,ASC,ATN,AUDIO,BACKUP,CHR$,CIRCLE,CLEAR,CLOAD
940 DATA CLOSE,CLS,COLOR,CONT,COPY,COS,CSAVE,CVN,DATA,DEF
950 DATA DEL,DIM,DIR,DSKINI,DSKI$,DLOAD,DRAW,DRIVE,DSKO$,EDIT
960 DATA ELSE,END,EOF,EXEC,EXP,FIELD,FILES,FIX,FN,FOR
970 DATA FREE,GET,GO,HEX$,IF,INKEY$,INPUT,INSTR,INT,JOYSTK
980 DATA KILL,LEFT$,LEN,LET,LIST,LLIST,LINE,LOAD,LOC,LOF
990 DATA LOG,LSET,MEM,MERGE,MID$,MKN$,MOTOR,NEW,NEXT,NOT
1000 DATA ON,OFF,OPEN,OR,PAINT,PCLEAR,PCLS,PCOPY,PEEK,PLAY
1010 DATA PMODE,POINT,POKE,POS,PPOINT,PRESET,PRINT,PSET,PUT,READ
1020 DATA REM,RENAME,RENUM,RESET,RESTORE,RETURN,RIGHT$,RND,RSET,RUN
1030 DATA SAVE,SCREEN,SET,SGN,SKIPF,SIN,SOUND,STEP,STOP,STRING$
1040 DATA STR$,SUB,SQR,TAB(,TAN,THEN,TIMER,TO,TROFF,TRON
1050 DATA UNLOAD,USING,USR,VAL,VARPTR,VERIFY,WRITE,+,-,*
1060 DATA /,^,>,=,<,'
1200 'main Program
1210 CLS:PRINT@44,"MENU"
1220 PRINT@100,"1. ENTER KEYWORDS"
1230 PRINT@164,"2. SAVE TABLE TO TAPE"
1240 PRINT@226,"3. READ TABLE FROM TAPE"
1250 PRINT@292,"4. PRINT TABLE"
1260 PRINT@356,"5. PRINT TABLE - SCREEN"
1270 PRINT@420,"6. END"
1280 PRINT@483,"SELECT OPTION <1-6>?";
1290 A$=INKEY$:IFA$=""THEN1290
1300 IFA$<"1"ORA$>"5"THEN1290
1310 I=ASC(A$)-48
1320 ON I GOSUB310,610,700,410,810,1340
1330 GOTO1210
1340 CLS:PRINT@192,"BE SURE YOU TURN EVERYTHING OFF.";
```

Table 1

COMMAND	TOKEN	
	COCO	DRAGON
ABS	255130	255130
AND	176	200
ASC	255138	255144
ATN	255148	255139
AUDIO	161	163
BACKUP	221	0
CHR$	255139	255145
CIRCLE	194	177
CLEAR	149	150
CLOAD	151	153
CLOSE	154	156
CLS	158	160
COLOR	193	176
CONT	147	148
COPY	222	0
COS	255149	255137
CSAVE	152	154
CVN	255162	0
DATA	134	134
DEF	185	152
DEL	181	166
DIM	140	140
DIR	206	0
DSKINI	220	0
DSKI$	223	0
DLOAD	202	185
DRAW	198	181
DRIVE	207	0
DSKO$	224	0
EDIT	182	167
ELSE	132	132
END	138	138
EOF	255140	255146
EXEC	162	164
EXP	255151	255135
FIELD	208	0
FILES	209	0
FIX	255152	255148
FN	204	190
FOR	128	128
FREE	255163	0
GET	196	179
GO	129	129
HEX$	255156	255149
IF	133	133
INKEY$	255146	255154
INPUT	137	137
INSTR	255158	255157
INT	255129	255129
JOYSTK	255141	255147
KILL	210	0
LEFT$	255142	255150
LEN	255135	255141
LET	186	142
LIST	148	149
LLIST	155	157
LINE	187	170
LOAD	211	0
LOC	255164	0
LOF	255165	0
LOG	255153	255134
LSET	212	0
MEM	255147	255155
MERGE	213	0
MID$	255144	255152
MKN$	255166	0
MOTOR	159	161
NEW	150	151
NEXT	139	139
NOT	168	192
ON	136	136
OFF	170	194
OPEN	153	155
OR	177	201
PAINT	195	178

Continued on page 43

Table 1 continued

PCLEAR	192	175
PCLS	188	171
PCOPY	199	182
PEEK	255134	255140
PLAY	201	184
PMODE	200	183
POINT	255145	255153
POKE	146	147
POS	255154	255131
PPOINT	255160	255159
PRESET	190	173
PRINT	135	135
PSET	189	172
PUT	197	180
READ	141	141
REM	130	130
RENAME	214	0
RENUM	203	186
RESET	157	159
RESTORE	143	144
RETURN	144	145
RIGHT$	255143	255151
RND	255132	255132
RSET	215	0
RUN	142	143
SAVE	216	0
SCREEN	191	174
SET	156	158
SGN	255128	255128
SKIPF	163	165
SIN	255133	255136
SOUND	160	162
STEP	169	193
STOP	145	146
STRING$	255161	255160
STR$	255136	255142
SUB	166	189
SQR	255155	255133
TAB	164	187
TAN	255150	255138
THEN	167	191
TIMER	255159	255158
TO	165	188
TROFF	184	169
TRON	183	168
UNLOAD	219	0
USING	205	205
USR	255131	255161
VAL	255137	255143
VARPTR	255157	255156
VERIFY	218	0
WRITE	217	0
+	171	195
-	172	196
*	173	197
/	174	198
^	175	199
>	178	202
=	179	203
<	180	204
'	131	131

Listing 3: gives the tables a more useable and condensed form

```
10 '*************************
20 '***   CLOAD"TKNCONV"   ***
30 '*************************
40 DIMTC(136),TD(136),CT(112),DT(112)
50 CLS:PRINT@384,"POSITION TAPE - PRESS play","PRESS enter TO CONTINUE"
60 A$=INKEY$:IFA$<>CHR$(13)THEN60
70 CLS:PRINT"SEARCHING FOR convrt"
80 OPEN"I",-1,"CONVRT"
90 CLS:PRINT"LOADING convrt"
100 FORI=0TO136:IFEOF(-1)THEN120
110 INPUT#-1,A$,TC(I),TD(I):NEXT
120 CLOSE-1
130 CLS:PRINT"LOADING COMPLETE":PRINT:PRINT"DOING SORT"
140 FORI=128TO205
150 FORJ=0TO135
160 IFTC(J)=I THENCT(I-127)=TC(J):DT(I-127)=TD(J):GOTO180
170 NEXTJ
180 NEXTI
190 FORI=255128TO255161
200 FORJ=0TO136
210 IFTC(J)=I THENCT(I-255049)=TC(J)-255000:DT(I-255049)=TD(J)-255000:GOTO230
220 NEXTJ
230 NEXTI
240 CLS:PRINT"SORT COMPLETED":PRINT@384,"POSITION TAPE - PRESS play AND
    record":PRINT"PRESS enter TO CONTINUE";
250 A$=INKEY$:IFA$<>CHR$(13)THEN250
260 CLS:PRINT"SAVING lookup TO TAPE"
270 OPEN"O",-1,"LOOKUP"
280 FORI=1TO112:PRINT#-1,CT(I),DT(I):NEXTI
290 CLOSE-1
300 CLS:PRINT"lookup SAVED TO TAPE"
```

Table 1

TOKEN	COMMAND	
	COCO	DRAGON
128	FOR	FOR
129	GO	GO
130	REM	REM
131	'	'
132	ELSE	ELSE
133	IF	IF
134	DATA	DATA
135	PRINT	PRINT
136	ON	ON
137	INPUT	INPUT
138	END	END
139	NEXT	NEXT
140	DIM	DIM
141	READ	READ
142	RUN	LET
143	RESTORE	RUN
144	RETURN	RESTORE
145	STOP	RETURN
146	POKE	STOP
147	CONT	POKE
148	LIST	CONT
149	CLEAR	LIST
150	NEW	CLEAR
151	CLOAD	NEW
152	CSAVE	DEF
153	OPEN	CLOAD
154	CLOSE	CSAVE
155	LLIST	OPEN
156	SET	CLOSE
157	RESET	LLIST
158	CLS	SET
159	MOTOR	RESET
160	SOUND	CLS
161	AUDIO	MOTOR

Continued on page 45

162	EXEC	SOUND	213	MERGE	??
163	SKIPF	AUDIO	214	RENAME	??
164	TAB	EXEC	215	RSET	??
165	TO	SKIPF	216	SAVE	??
166	SUB	DEL	217	WRITE	??
167	THEN	EDIT	218	VERIFY	??
168	NOT	TRON	219	UNLOAD	??
169	STEP	TROFF	220	DSKINI	??
170	OFF	LINE	221	BACKUP	??
171	+	PCLS	222	COPY	??
172	-	PSET	223	DSKI$	??
173	*	PRESET	224	DSKO$	??
174	/	SCREEN	255128	SGN	SGN
175	^	PCLEAR	255129	INT	INT
176	AND	COLOR	255130	ABS	ABS
177	OR	CIRCLE	255131	USR	POS
178	>	PAINT	255132	RND	RND
179	=	GET	255133	SIN	SQR
180	<	PUT	255134	PEEK	LOG
181	DEL	DRAW	255135	LEN	EXP
182	EDIT	PCOPY	255136	STR$	SIN
183	TRON	PMODE	255137	VAL	COS
184	TROFF	PLAY	255138	ASC	TAN
185	DEF	DLOAD	255139	CHR$	ATN
186	LET	RENUM	255140	EOF	PEEK
187	LINE	TAB	255141	JOYSTK	LEN
188	PCLS	TO	255142	LEFT$	STR$
189	PSET	SUB	255143	RIGHT$	VAL
190	PRESET	FN	255144	MID$	ASC
191	SCREEN	THEN	255145	POINT	CHR$
192	PCLEAR	NOT	255146	INKEY$	EOF
193	COLOR	STEP	255147	MEM	JOYSTK
194	CIRCLE	OFF	255148	ATN	FIX
195	PAINT	+	255149	COS	HEX$
196	GET	-	255150	TAN	LEFT$
197	PUT	*	255151	EXP	RIGHT$
198	DRAW	/	255152	FIX	MID$
199	PCOPY	^	255153	LOG	POINT
200	PMODE	AND	255154	POS	INKEY$
201	PLAY	OR	255155	SQR	MEM
202	DLOAD	>	255156	HEX$	VARPTR
203	RENUM	=	255157	VARPTR	INSTR
204	FN	<	255158	INSTR	TIMER
205	USING	USING	255159	TIMER	PPOINT
206	DIR	??	255160	PPOINT	STRING$
207	DRIVE	??	255161	STRING$	USR
208	FIELD	??	255162	CVN	??
209	FILES	??	255163	FREE	??
210	KILL	??	255164	LOC	??
211	LOAD	??	255165	LOF	??
212	LSET	??	255166	MKN$	!!

Listing 4: translates Dragon to CoCo programs

```
60000 '**************************
60010 '***   CLOAD"DRTOCC"    ***
60020 '**************************
60030 DIMTC(112),TD(112)
60040 CLS:PRINT"LOAD LOOKUP TABLE"
      :PRINT@384,"POSITION TAPE - PRESS
      Play","PRESS enter TO CONTINUE"
60050 A$=INKEY$:IFA$<>CHR$(13)THEN60050
60060 CLS:PRINT"SEARCHING FOR lookup"
60070 OPEN"I",-1,"LOOKUP"
60080 CLS:PRINT"FOUND lookup"
60090 FORI=1TO112:IFEOF(-1)THEN60110
60100 INPUT#-1,TC(I),TD(I):NEXTI
60110 CLOSE-1
60120 CLS:PRINT"LOADING COMPLETE"
60130 ED=PEEK(25)*256+PEEK(26)
60140 EXEC32760
60150 PRINT:PRINT"PROGRAM BEING CONVERTED
      ":PRINT@130,"START ADDRESS";
      PEEK(25)*25 6+PEEK(26)+4
60160 PRINT@162,"END ADDRESS  "ED
60170 PRINT@290,"CURRENT ADDRESS"
60180 GOTO60260
60190 'lookup for 255128<TK<255161
60200 FORK=79TO112:GOTO60230
60210 'lookup for 128<=TK<=205
```

Continued on page 47

Listing 4 continued

```
60220 FORK=1TO78
60230 IFTD(K)=TK THENTK=TC(K):RETURN
60240 NEXTK:CLS:PRINT"ERROR IN TOKEN
      CONVERSION":STOP:RETURN
60250 'main Program for conversion
60260 FORI=PEEK(25)*256+PEEK(26)+4TOED
60270 PRINT@307,I
60280 TK=PEEK(I)
60290 IFTK=0THENI=I+4:GOTO60340
60300 IFTK<128THEN60340
60310 IFTK<206THENGOSUB60210:GOTO60330
60320 IFTK=255THENI=I+1:TK=PEEK(I):
      GOSUB60200
60330 POKEI,TK                 60340 NEXTI
60350 CLS:PRINT"CONVERSION COMPLETE.
      CONVERSION PROGRAM DELETED.
      ":PRINT"CSAVE CONVERTED PROGRAM."
60360 DEL60000-
```

Listing 5: merge program

```
10 '**************************
20 '***   CLOAD"MERGE-M"   ***
30 '**************************
40 CLS:PRINT"cload TAPE TO BE CONVERTED.
drtocc' AND TYPE run"
TYPE exec32749.":PRINT:PRINT"cload'
50 CLEAR 200,32748
60 FOR A=32749 TO 32765
70 READ B: POKE A,B: NEXT
80 DATA 158,25,175,140,12,158,27,48,30
90 DATA 32,3,174,140,3,159,25,57
```

Listing 6

```
60000 '**************************
60010 '***   CLOAD"DRTOCCD"   ***
60020 '**************************
60030 '****  BY J. NICHOLS   ****
60040 '**************************
60050 'token conversions.  The first data element is the coco token and the seco
nd data element is the corresPonding dragon token.
60060 DATA128,128,129,129,130,130,131,131,132,132,133,133,134,134,135,135,136,13
6,137,137
60070 DATA138,138,139,139,140,140,141,141,142,143,143,144,144,145,145,146,146,14
7,147,148
60080 DATA148,149,149,150,150,151,151,153,152,154,153,155,154,156,155,157,156,15
8,157,159
60090 DATA158,160,159,161,160,162,161,163,162,164,163,165,164,187,165,188,166,18
9,167,191
60100 DATA168,192,169,193,170,194,171,195,172,196,173,197,174,198,175,199,176,20
0,177,201
60110 DATA178,202,179,203,180,204,181,166,182,167,183,168,184,169,185,152,186,14
2,187,170
60120 DATA188,171,189,172,190,173,191,174,192,175,193,176,194,177,195,178,196,17
9,197,180
60130 DATA198,181,199,182,200,183,201,184,202,185,203,186,204,190,205,205,128,12
8,129,129
60140 DATA130,130,131,161,132,132,133,136,134,140,135,141,136,142,137,143,138,14
4,139,145
60150 DATA140,146,141,147,142,150,143,151,144,152,145,153,146,154,147,155,148,13
9,149,137
60160 DATA150,138,151,135,152,148,153,134,154,131,155,133,156,149,157,156,158,15
7,159,158
60170 DATA160,159,161,160
60180 ' read conversion table into arrays
60190 DIMTC(112),TD(112)
60200 FORI=1TO112
60210 READTC(I),TD(I)
60220 NEXTI
60230 'set end Point for conversion.
60240 ED=PEEK(25)*256+PEEK(26)
60250 'merge Programs
60260 EXEC32760
60270 CLS:PRINT:PRINT"PROGRAM BEING CONVERTED":PRINT@130,"START ADDRESS";PEEK(25
)*256+PEEK(26)+4
60280 PRINT@162,"END ADDRESS  "ED
60290 PRINT@290,"CURRENT ADDRESS"
60300 GOTO60390
60310 'lookuP for tokens in the range of 255 128 to 255 161.
60320 FORK=79TO112:GOTO60350
60330 'lookuP for tokens in the range of 128 to 205
60340 FORK=1TO78
60350 IFTD(K)=TK THENTK=TC(K):RETURN
60360 'if you are converting a coco Program to dragon change line 60300 to read
IFTC(K)=TK THENTK=TD(K):RETURN
60370 NEXTK:CLS:PRINT"ERROR IN TOKEN CONVERSION":STOP:RETURN
60380 'main Program for conversion
60390 FORI=PEEK(25)*256+PEEK(26)+4TOED
60400 PRINT@307,I
60410 'read token from Program to be converted
60420 TK=PEEK(I)
60430 IFTK=0THENI=I+4:GOTO60480'line end Point. JumP to start of next line.
60440 IFTK<128THEN60480'not a token
60450 IFTK<206THENGOSUB60330:GOTO60470
60460 IFTK=255THENI=I+1:TK=PEEK(I):GOSUB60320'two byte token. read next byte and
 convert.
60470 POKEI,TK'change token in Program being converted.
60480 NEXTI
60490 CLS:PRINT"CONVERSION COMPLETE. CONVERSION PROGRAM DELETED.":PRINT"csave  C
ONVERTED PROGRAM."
60500 DEL60000-'delete conversion Program from memory.
```

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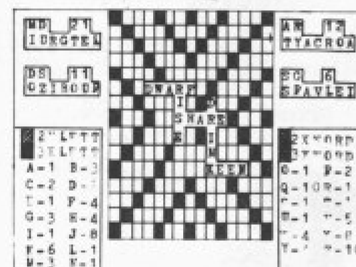
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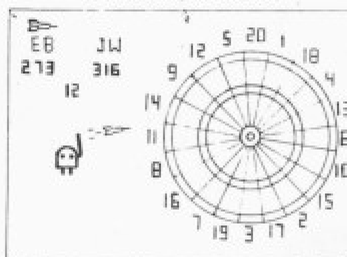
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IF YOU'RE an avid reader of classified advertisements, as I am, then you'll have spotted one from a small software house called Nemesis offering an adventure with the strange title **The Trail of Arnold Blackwood.** Intrigued to discover more about the enigmatic Arnold I wrote off for a copy. What came back was a straightforward but interesting adventure, worth checking out, and more professionally presented (in terms of the program if not the packing) than many other small-scale productions.

Handy addition

The adventure uses its own redefined character set to make the screen lay-out more attractive, though Nemesis says that in order to do this it has to sacrifice a SAVE routine, which is unfortunate. Arnold accepts the usual verb-noun input, with words being recognised by their first three letters, and an unusual addition is that you don't need to type GET to pick up an object: the program assumes that's what you want to do, unless you specify some other action.

Each place you visit has three headings, which are emphasised in neat little boxes: LOCATION, VISIBLE and DIRECTIONS, which are self-explanatory. What isn't self-explanatory, is the purpose of the adventure. You take the part of Arnold Blackwood, and you're suffering from loss of memory. You start in a thicket on the Estate of Lord Erebus and you know you're on some kind of mission . . . but what? You also know that Lord Erebus has plenty of expensive baubles, so . . .

The first set of locations has you wandering around outside the house, trying to discover a way through the locked oak door. Searching sheds and other buildings gives you a few tools, while wandering into a greenhouse has you confronted by a triffid. If you haven't got the item that sorts out the triffid, then you're stuck as the greenhouse door closes behind you and as the program doesn't recognise QUIT, END or similar words there seemed to be no alternative but to re-LOAD, though later I discovered you could BREAK and GOTO 10, which sets you back to the opening location but with the objects you'd already accumulated still in your possession. (Though loaded with CLOADM, the program is apparently a mix of Basic and machine code.)

You might bump into a mobile oracle, which gives you advice along the lines of "Don't eat the kipper" or "Bonzo is a cat" when consulted, some of which starts to make sense when you enter the house and the adventure begins to open out. You encounter a chambermaid and Mexican Pete, not to mention a ZX-81, and while this is far from being a vast adventure it is puzzling and also includes some amusing responses from time to time. At £5.50 it is reasonably priced and is obtainable from Nemesis at 10 Carlow Road, Ringstead, Kettering, Northants NN14 4DW.

More expensive at £9.95 are two titles in the Mysterious Adventure series from Channel 8 and if you enjoyed The Golden Baton, which was author Brian Howarth's first attempt at adventure writing, you can go on to not only a follow-up with **Arrow of Death,** but a follow-up to the follow-up with **Arrow of Death Part 2.** They follow the format of the rest of the series, having a Dragon 64 graphics version and a Dragon 32 text-only version on the same tape and making use of the small character set which makes the screen look more like a Spectrum than a Dragon.

Now when you acquired the Golden Baton at the end of the first adventure (what do you mean, you haven't managed it yet??) you thought your troubles were over. Indeed they were, for a time, till the weather in the kingdom turned bad, the crops began to fail and there was nothing but gloom and despondency all around. The Baton no longer shines like gold, but is tarnished and evil seems to be now associated with it. Your task is to find the source of the evil and the means of dealing with it. You begin in the Palace of the King, where the Golden Baton is kept in the Throne Room, though any attempt to do anything with it at first is doomed to disaster . . . in fact that has to wait till Part 2, as Part 1 merely has you finding what it is that you need in order to deal with the Baton.

As I've said before about this series, they're not to everyone's taste and while I find them enjoyably tricky there are plenty who seem to think they're unbelievably simple. Lucky them! What I like about them is that everything has a purpose, even though this might not become apparent till much later on in the story. You also get to know which locations are likely to be significant, even if this isn't obvious at first. Find a shovel and you can be sure you'll have to DIG all over the place to unearth something useful (this happens in Part 2), and if you SEARCH everywhere and EXAMINE everything then the means to progress just has to be there.

The text descriptions are kept very brief and there would be a lot more atmosphere about the stories if these were expanded a little, but there are certainly plenty of locations to explore. In the first part you soon leave the Palace behind and start wandering round forests, down cliffs and into caves — by this time you've already discovered that the means to deal with the evil is going to be an arrow, so you're searching for the parts that you'll need.

Seek and destroy

When the second adventure begins, you are armed with a sword and everything you need in order to make the arrow, with which you must destroy Xerdon, who is the source of the evil. But the only one who can help you make the arrow is Armid, the Royal Fletcher, so first you must *getcher* Fletcher. The terrain here is very familiar, with narrow gorges, rope bridges, stone corridors and dimly-lit caverns . . . yes, the inevitable old lamp is in here, too, and the flint with which to light it is hidden somewhere. What would we do without that old lamp?

Characters in the adventure include a sinister guard, a happy mule, an animated skeleton and . . . hello, who's this familiar figure? Yes, it's the old beggar . . . where do all the young beggars get to, I wonder? But though some of the scenes and tasks are similar to many another adventure, both parts of The Arrow of Death should certainly give you your money's worth, like the rest of the Mysterious Adventures. Buy them all and there's adventure in your Dragon for many more months to come. ■

Each month Mike Gerrard will be looking at adventures for the Dragon. If you have an adventure you want reviewed or you need advice or have some to offer write to Mike Gerrard's Adventure Trail at *Dragon User*.



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Pixel problem

I HAVE encountered a problem in trying to move shapes around the hi-res screen through machine code.

Due to the byte mapped nature of the screen it would appear impossible to move any one screen location (byte) on to another location horizontally in any step size less than a byte. This byte jumping gives a jerky appearance to the movement.

Simon Lovett
Cork
Eire

IT IS simple to move graphics pixel by pixel using assembly language, if you use two shift commands. For example, in mode 4, to move a byte at loc. 3072 one pixel to the right you would use the following code:

```
LDX # 3072
LDA ,X
CLRB
LSRA
RORB
STA ,X
STB 1,X
```

Using successive LSR and ROR's it is possible to smoothly move as many bytes as you like.

Relocatable routine

DRAGON'S Basic has no instructions such as "RESTORE N" which is very useful when managing numerous data.

Do you know of a routine to replace RESTORE N?

Gilles Vidor
Montmorency
France

THE DRAGON'S restore command can only be used to reset the data pointer to the start of the program, not to any particular line. The short listing given will, when included in your programs, give this facility. To use it, simply type XX=USR0(nn) where "nn" is the line number at which you want to start reading data. The routine is relocatable in memory.




```
5 'RESTORE TO A LINE
  NUMBER
10 CLEAR200,32744
20 FOR I=0 TO 21: READ
   A$: POKE 32745+I,
   VAL("&H"+A$): NEXT
30 DATA BD, 8B, 27, DD,
   2B, 9E, 19, BD, 84, 03, 25,
   05, 30, 1F, 9F, 33, 39, C6,
   0E, 7E, 83, 44
40 DEF USR0=32745
```

Confusing PUT options

AFTER playing around with the GETting and PUTting of graphics, I have come across a problem. I started experimenting with the other commands to PSET (that is, AND, NOT and so on). A problem arises when I use these commands. I started out by using OR, this should, according to the manual, have the effect of overlaying one drawing with another.

The result of using this is that the picture you are PUTting goes "weird" and the picture you are trying to overlay gets erased. None of the other commands work either. Can you solve my problem?

Richard Boryana
Wellingborough
Northants

THE PUT options OR, AND, NOT do work correctly, but they are a little confusing. Using "OR" will logically or the image in the array with that on the screen. This has the effect of blue + yellow = red, and any other colour + green = other colour. Using AND has the following effect: red + any colour = that colour, any colour + green = green. These two options work best if a red image is held in the array and is PUT on to a green background.

The NOT option takes no notice of what's actually in the array, it simply inverts a section of the screen within the given co-ordinates (that is, green becomes red, yellow becomes blue and vice versa).

Basic stack

WHAT DOES the FOR/NEXT and GOSUB/RETURN do towards the Basic stack? Is there a way to PUSH/PULL on it?

Olav Nielsen
Odense
Denmark

EACH TIME a FOR NEXT loop is used, or a gosub is encountered, addresses are pushed on to the Basic stack. When a NEXT or RETURN is used, an address is pulled from this stack. As the same stack is used for both loops and subroutines you cannot do the following:

```
10 FOR I = 1 TO 10
20 GOSUB 50
30 STOP
50 NEXT I
```

This stack is completely separate from the 6809 stacks and should not be confused with them, the Basic stack cannot be directly used by the programmer.

Opcode error

HAVING recently started machine code, I am desperately trying to use the high resolution subroutines (for example, GET, PUT) in machine code. The method I use is to fool the computer in to running a Basic line during a machine code program, but with little success. The following routine should set a point at (100,100):

```
LDX     $A6
PSHS    X
LEAX    @PSET, PCR
LDA     ,X
ANDCC   £$FE
JSR     42735 ; PSET
        routine location
PULS    X
STX     $A6
RTS
@PSET FCB 172, 40, 49, 48,
48, 44, 49, 48, 48, 41, 0
RTS
10 PMODE 4, 1: PCLS:
   SCREEN 1,1: EXEC
   &H4E21
20 GOTO 20
```

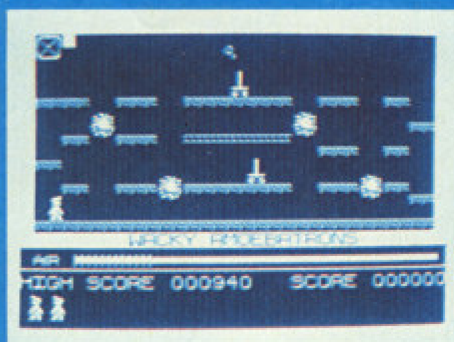
The problem arises when entring the @PSET FCB line, as the cursor reaches the end of the line and on entering the remaining numbers on the next line, an invalid opcode error is reported during assembly. Can you be of any help?

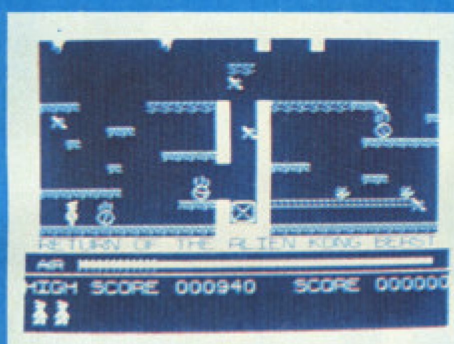
N Jeyadevan
Nantwich
Cheshire

THE PROBLEM is as you suspected in the line @PSET, it is not necessary to have the commands token value (172) in this line, a correct version of this program would read:

```
LDX     166
PSHS    X
LEAX    @PSET, PCR
LDA     ,X
STX     166
JSR     42735
PULS    X
STX     166
RTS
@PSET 40,49,48,48,44,49,
48,48,41,58
```







MANIC MINER

Miner Willy, while prospecting down Surbiton way stumbles upon an ancient, long forgotten mineshaft. On further exploration, he finds evidence of a lost civilisation far superior to our own, which used automatons to dig deep into the Earth's core to supply the essential raw materials for their advanced industry. After centuries of peace and prosperity, the civilisation was torn apart by war, and lapsed into a long dark age, abandoning their industry and machines. Nobody, however, thought to tell the mine robots to stop working, and through countless aeons they had steadily accumulated a huge stockpile of valuable metals and minerals, and Miner Willy realises that he now has the opportunity to make his fortune by finding the underground store. In order to move to the next chamber, you must collect all the flashing keys in the room while avoiding nasties like Poisonous Pansies and Spiders and Slime and worst of all, Manic Mining Robots. When you have all the keys, you can enter the portal which will now be flashing. The game ends when you have been 'got' or fallen heavily three times.



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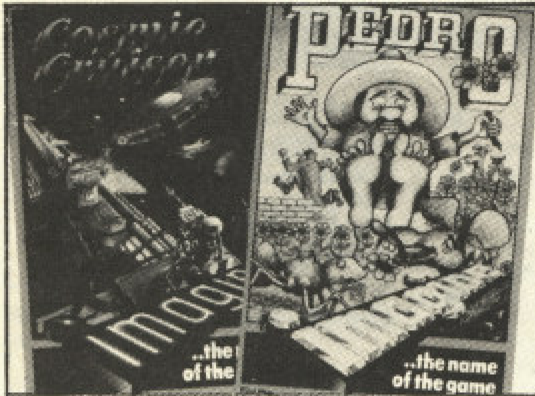
....

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Competition Corner

Answers to Competition Corner, *Dragon User*, 12/13 Little Newport Street, London WC2R 3LD



PRIZE

BEAU JOLLY is offering ten readers a chance to win one of its Dragon "valuepacks". The packs contain five games from Imagine Software's range of titles. They are: Pedro, BC Bill, Cosmic Cruiser, Leggit and Arcadia.

RULES

TO WIN a valuepack you must show both the answer to the competition and how to solve it with the use of a Basic program developed on your Dragon. Please to not send in a cassette containing the answer. As a tie-breaker complete the following sentence in 15 words of less; "I want to own Beau Jolly's Dragon valuepack because......"

Your entry must arrive at *Dragon User* by the last working day of December. The winners and the solution to the quiz will be published in our March issue. Entries will not be acknowledged and we cannot enter into correspondence on the result.

SEPTEMBER WINNER

THE WINNER of the September competition and recipient of £250 of software from Microdeal is David Richardson of Epsom in Surrey. David correctly stated that the correct solution was 84648. This is because 84648 multiplied by itself is 7165283904. This is a ten-digit number in which each of the digits 0,1,2,3,4,5,6,7,8,9 occurs once and only once.

RINGWORLD WINNERS

THE 50 winners in Wintersoft's Ringworld competition each receive a copy of its latest adventure, the Return of the Ring. They are:

Michael Blencoe, Plymouth; A Kirk Cheshire; M Jones, Kent; Simon Green, Tyne & Wear; Fraser, Kempton; Wai Kee Tsang, Staffs; G Petty, Swansea; P Richardson, Sussex; R Hamilton, Leicester; P Moore, Newcastle; L Barrass, Doncaster; S Parker, Bucks; M Pasos, Leeds; A K Jones, Clwyd; G Southgroen, Kent; K M Holmes, Essex; P Begg, Aberdeen; C Edwards, Preston; A Stewart, Kent; J Pullman, Humberside; D Spiller, South Wirral; S Hunter, Southampton; G Thomas, Middlesex; R Davies, Kent, R Getting, Kent; R Daniel, Beds; A Cook, Glasgow; M Arnold, Hants; S Mattocks, Norfolk; E Hopkins, Kent; N P Skinner, Notts; J Cardwell, Kent; W Greenslade, Sussex; J Burroughs, Herts; M Backshall, Bucks; G Smith, Gwent; R Leamon, Swansea; J Hughes, Manchester; K Webb, N Ireland; R Sanbeck, Kent; A McFarlane, Belfast; E Armstrong, N Ireland; A Page, W Midlands; D Potter, Northamptonshire; I Bascoby, Manchester; G Kenyon, Lancs; P A Gordon, E Sussex; J Williams, Birmingham; S O'Connor, Suffolk; G Teek, Southend.

All the winners have been contacted.

Magic cards

*Beau Jolly provides the prizes to **Gordon Lee's** four — card game*

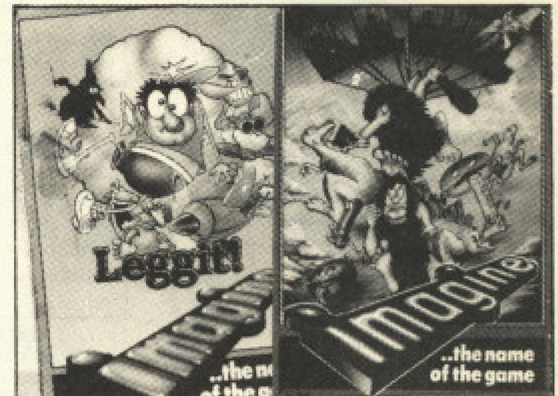
LAST CHRISTMAS on this page we took a look at the computer versions of a couple of traditional party games, so this year how about amazing the family with the computerised magic trick. Don't worry, we won't be sawing a Dragon in half!

Before starting, the program below should be loaded in to your computer. Then hand out an ordinary pack of cards to be shuffled and invite each of your spectators to select a card. Announce that the Dragon will attempt to identify the cards selected and invite each person in turn to sit at the computer. The computer will display the names of a number of cards and will ask if the spectator's card is listed.

Selections

By replying (using keys "Y" or "N") a further five selections of cards are displayed. After the final reply has been made, the name of the card selected will be announced on the screen. Magic!

This month's competition is also related to playing cards: The other day the following curious conversation took place between the eccentric mathematician Professor Otto Hex and his equally eccentric son:



Professor Hex: "I have in my hand four cards taken from a standard deck of playing cards. They are a club, a diamond a heart and a spade. If I were to add the face value of the club to the face value of the diamond and then add the heart to the space and *multiply* these two totals together, the product is equal to Bertram Byte's age next birthday!"

Hex Junior: "There are many combinations of cards that will produce that total."

Professor Hex: "Quite correct. In fact the number of different combinations of four cards taken from a standard pack that will equal that total is in fact, a prime number."

Hex Junior: "I still need more information."

Professor Hex: "Well, two cards have the same value, but neither is the club — which is a nine."

Hex Junior: "Now I know all four cards." (Note that Jack = 11, Queen = 12 and King = 13 — and it should be assumed that sufficient time elapsed between each statement to allow Hex Junior to make the necessary calculations.

What were the four cards (and how old is Bertram Byte)? ■

Loader program listing

```
100 CLEAR 1500:DIM B$(52),C$(52):M$="":CLS
110 DATA ACE,TWO,THREE,FOUR,FIVE,SIX,SEVEN,EIGHT,NINE,TEN,JACK,QUEEN,KING
120 FOR N=1 TO 52:M$=M$+CHR$(127+N):B=N:B$(N)=""
130 IF B<1 AND LEN(B$(N))<6 THEN B$(N)="0"+B$(N):GOTO 130
140 IF B>=1 AND B/2<>INT(B/2) THEN B$(N)="1"+B$(N):B=(B-1)/2
150 IF B>=1 AND B/2=INT(B/2) THEN B$(N)="0"+B$(N):B=B/2
160 IF LEN(B$(N))<6 THEN 130
170 NEXT N
180 CLS:PRINT@202,"SHUFFLING":N$=M$:FOR N=1 TO 52:X=RND(LEN(N$))
190 Y=ASC(MID$(N$,X,1))-127:N$=LEFT$(N$,X-1)+RIGHT$(N$,LEN(N$)-X)
200 IF Y<14 THEN S$="CLUBS"
210 IF Y>13 AND Y<27 THEN Y=Y-13:S$="DIAMONDS"
220 IF Y>26 AND Y<40 THEN Y=Y-26:S$="HEARTS"
230 IF Y>39 THEN Y=Y-39:S$="SPADES"
240 RESTORE:FOR F=1 TO Y:READ C$(N):NEXT F:C$(N)=C$(N)+" OF "+S$:NEXT N
250 T=0:FOR F=1 TO 6:CLS:C=33:D=39:H=48:S=55
260 PRINT@1,"clubs diamonds hearts spades"
270 FOR N=1 TO 52:IF MID$(B$(N),F,1)="0" THEN 320
280 IF RIGHT$(C$(N),2)="BS" THEN PRINT@C,LEFT$(C$(N),LEN(C$(N))-9);:C=C+32
290 IF RIGHT$(C$(N),2)="DS" THEN PRINT@D,LEFT$(C$(N),LEN(C$(N))-12);:D=D+32
300 IF RIGHT$(C$(N),2)="TS" THEN PRINT@H,LEFT$(C$(N),LEN(C$(N))-10);:H=H+32
310 IF RIGHT$(C$(N),2)="ES" THEN PRINT@S,LEFT$(C$(N),LEN(C$(N))-10);:S=S+32
320 NEXT N:PRINT@484,"IS YOUR CARD HERE? (Y/N)";
330 A$=INKEY$:IF A$="" THEN 330
340 IF A$="Y" THEN T=T+2↑(6-F)
350 NEXT F:CLS:PRINT@128,"I CAN NOW GUESS YOUR CARD";
360 PRINT@224,"IT WAS THE ";C$(T):PRINT@448,"ANOTHER GO? (Y/N)"
370 A$=INKEY$:IF A$="" THEN 370
380 IF A$="N" THEN END ELSE 180
```

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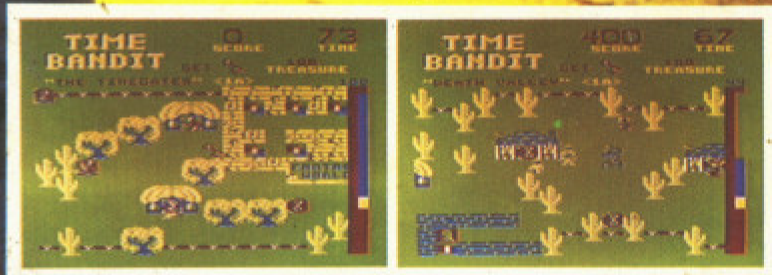
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